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Genus *Aedes* Meigen, Subgenus *Ayurakitia* Thurman

by

John F. Reinert

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CONTENTS

CONTRIBUTIONS TO THE MOSQUITO FAUNA OF SOUTHEAST ASIA. - XV.

GENUS *AEDES* MEIGEN, SUBGENUS *AYURAKITIA* THURMAN[1]

By

John F. Reinert[2]

ABSTRACT

The subgenus *Ayurakitia* Thurman of *Aedes* is defined, discussed and compared to related subgenera. Descriptions, illustrations and keys are given for the known stages of the 2 included species, *peytoni*, new species and *griffithi* Thurman.

INTRODUCTION

The taxonomic history of *Ayurakitia* is brief. *Ayurakitia* was originally erected as a monotypic genus by D. C. Thurman, Jr. in 1954. E. H. B. Thurman (1959: 74) retained the single species, *griffithi* Thurman, in the genus but Mattingly (1971: 31) in note number 28 of his key to the world genera of mosquitoes, reduced *Ayurakitia* to subgeneric rank in the genus *Aedes* Meigen. In the present paper I have retained *Ayurakitia* as a subgenus of *Aedes* since it fits well within the genus in all aspects except the absence of postspiracular bristles in the adults. This feature is also shared by *Kompia* Aitken, a North American monotypic subgenus of *Aedes*. The subgenus as defined possesses characters in all known stages that distinguishes it from the other subgenera of *Aedes*. A new species, *peytoni*, is placed in *Ayurakitia* and is described herein.

During the course of this revision, I examined all specimens and types of *Ayurakitia* in the United States National Museum (Natural History) and the British Museum (Natural History).

Abbreviations used in references to literature conform to the World List of Scientific Periodicals, 4th edition, Butterworths, Washington, 1963. In the synonymy sections, an asterisk following the abbreviations used (♀ = female, ♂ = male) indicates that at least some portion of that sex is figured. The abbreviations used in distribution sections are the same as in the synonymy but with the following additions: P = pupa, L = larva, p = pupal skin and l = larval skin. Pupal descriptions, tables and key utilize the following abbreviations: C = cephalothorax; P = paddle; and I-VIII = abdominal segments 1 through 8. In larval descriptions the range of hair branching is given and the following abbreviations signify: A = antenna; C = head; I-VIII, X = abdominal segments 1 through 8 and 10; M = mesothorax; P = prothorax; S = siphon; and T = metathorax. When possible 10 specimens were used in determining the range, mode and mean hair branching in pupal and larval descriptions and tables. In the pupal descriptions, the number of branches on abdominal hair

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[2] Major, Medical Service Corps, U.S. Army, Department of Entomology, Walter Reed Army Institute of Research, Walter Reed Army Medical Center, Washington, D. C. 20012.

1-I is measured on the basal 0.33 of the hair. Measurement scales on the illustrations are in millimeters. Distribution records are indicated as follows: countries are in capital letters; provinces are in italics; and place names have the first letter capitalized. The number of specimens examined from each province follows the last place name of the province in the distribution sections. The spelling of provinces (changwats) and locality names in Thailand is taken from the Official Standard Names Gazetteer No. 97 prepared by the Office of Geography, Department of the Interior, Washington, D.C., April 1966. Locality names which do not appear in the gazetteer are spelled according to the data sheets and labels on the specimens.

The nomenclature and chaetotaxy used for females, males and male genitalia follow Knight (1970) and Knight and Laffoon (1970a, 1970b, 1971) and those for the pupae and larvae follow Belkin (1962). The terminology of the female genitalia is taken from Coher (1948).

GENUS *AEDES* MEIGEN
SUBGENUS *AYURAKITIA* THURMAN

Ayurakitia Thurman 1954, J. Wash. Acad. Sci. 44: 198.
Orthotype: *Ayurakitia griffithi* Thurman.
Aedes (Ayurakitia) Thurman, Mattingly 1971, Contr. Am. ent. Inst. 7(4): 31 (Reduced *Ayurakitia* to subgeneric rank in the genus *Aedes*).

The two species assigned to the subgenus share the following combination of characters.

FEMALE. *Head.* Antenna approximately 0.85 length of proboscis, pedicel with a few small broad brown scales mesally, flagellomere 1 with a few small brown scales; clypeus bare; maxillary palpus approximately 0.18 length of proboscis; proboscis approximately 1.05 length of femur I; eyes contiguous in front; vertex covered with broad decumbent golden scales with a band of overlapping broad silvery scales around the dorsal margin of the eyes which is separated in the middle by a small triangular patch of broad dark scales; occiput with narrow curved decumbent golden scales; numerous dark erect forked scales on occiput and vertex extending anteriorly to the silvery band of scales; ocular setae well developed and located along posterior margin of band of silvery scales. *Thorax.* Scutum covered with narrow curved reddish-black scales with prescutellar space bare; scutellum with a small patch of narrow curved dark scales on each lobe in addition to a few broad ones on the median lobe; following bristles present and well developed: median anterior promontory, acrostichal, dorsocentral (anterior and posterior), scutal fossal (3-4 anterior, 1-2 lateral and 1 posterior), 17-29 supra-alar, 1 postalar callar and scutellar (3-4 long and 1-2 short ones on each lateral lobe and 4 long and 1-3 short ones on median lobe); antepronota normal sized and widely separated, 7-10 bristles on each side; postpronotum with 2 posterior bristles, upper one short and lower one long; propleuron with a patch of overlapping broad silvery scales, 4-7 bristles; mesepisternum with an upper and posterior patch of broad overlapping silvery scales, 1 moderately long upper and 1 long lower bristle and 3-6 short lower bristles ventral to lower scale patch; prealar knob with 3-4 short bristles; mesepimeron with a patch of overlapping broad silvery scales, a small patch of 5-8 short bristles on upper area, 2 bristles on lower anterior area, upper bristle short and lower one long; other pleural areas bare. *Legs.* Femora I-III brown scaled with an apical silvery scaled spot and a golden scaled longitudinal stripe on anterior surfaces, the stripe is dorsal on I and ventral on II and III, II and III also with a dorsal silvery spot which extends onto anterior and posterior surfaces and is 0.30 from apex, posterior surface of I and II golden scaled with a longitudinal brown stripe which is ventral and on apical 0.75 of I and dorsal and on apical 0.70 of

II, posterior of III brown scaled with a ventral patch of golden scales on basal 0.50; tibiae I-III dark brown scaled with a posterior median longitudinal golden scaled stripe which extends from base to apex on I and II, and from basal 0.30 to apical 0.25 on III; tarsi I-III dark brown scaled with basal white scaled bands on tarsomeres 1-2 of I, on tarsomeres 1-3 of II and on tarsomeres 1-4 of III; posttarsi I-III each with 2 ungues, I and II with ungues equal, each with a tooth; III with ungues equal and simple. *Wing.* Upper calypter with 13-23 hairs; 2 remigial bristles. *Abdomen.* Terga dark brown scaled with silvery scaled lateral spots, II-VI also each with a dorsobasal golden scaled band; sterna each golden scaled with a narrow apical brown scaled band. *Genitalia.* Tergum VIII with numerous broad scales, 0.85 - 0.95 retracted into segment VII and only apex visible dorsally; apex broad and only slightly rounded apically; sternum VIII with numerous broad scales and a small median apical indentation; tergum IX membranous, moderately long, covered with minute setae and divided into 2 partially pigmented apical lobes each bearing 2-4 short bristles; cerci retracted and only apical 0.20 visible dorsally, each short, broad, flat and broadly rounded apically, tergal surface completely covered with minute spicules, short bristles and broad scales, 4-6 long stout bristles along margin at apex, sternal surface covered with minute setae and 4-7 short bristles along apical and distal 0.40 of outer area; postgenital plate with a deep median notch forming 2 lobes each bearing 3-6 short bristles, entire surface covered with minute setae; posterior cowl membranous and covered with tiny setae; anterior and posterior sigma each narrow, lightly pigmented and covered with minute setae; atrial plate moderately developed and lightly pigmented; insula tongue-like, membranous, covered with minute setae and with 6 long thin bristles on anterior 0.25; 3 pigmented, spherical spermathecae, 1 large and 2 slightly smaller ones.

MALE. Similar to female in general habitus. *Head.* Antenna with hair tufts directed mainly dorsally and ventrally, 0.75 - 0.84 length of proboscis; maxillary palpus 0.87 - 0.95 length of proboscis, segment 1 tiny, segments 2 and 3 long, segment 4 approximately 0.33 length of segment 3 and with 4 moderately long bristles dorsoapically, segment 5 short and downturned with 3-4 moderately long and 5-7 short bristles at apex. *Thorax.* Scutum with 15-22 supra-alar bristles; antepronotum with 7-10 bristles; postpronotum with 2-3 bristles; propleuron with 4-8 bristles; mesepisternum with 1 moderately long upper bristle and 1 long and 3-8 short lower bristles; prealar knob with 3-5 bristles; mesepimeron with 5-6 bristles on upper area and 1 long lower bristle. *Legs.* Posttarsi I-III each with 2 ungues, I with ungues unequal, larger one with a tooth, II with ungues unequal and simple, III with ungues equal and simple. *Wing.* Upper calypter with 14-20 hairs. *Abdomen.* Terga brown scaled with patterns of golden scales. *Genitalia.* Tergum IX with apical margin bilobed with 1-6 bristles on each lobe, basal margin with a deep median indentation, entire surface covered with minute spicules; gonocoxite long and narrow, dorsal and ventral surfaces with scattered long and moderately long bristles, ventral surface with 2 irregular rows of 14-20 stout moderately long bristles along sternomesal margin near middle entire gonocoxite covered with minute spicules; gonostylus with distal 0.73 expanded into a large bluntly pointed lateral lobe and a slightly longer, narrow mesal arm which bears an apical flattened gonostylar claw, lateral lobe with short and long hair-like spicules and short setae scattered over sternal and tergal surfaces; basal mesal lobes connected basally, basal 0.50 attached to mesal membrane of gonocoxite and distal 0.50 extended as a lobe with long subapical bristles and several shorter ones scattered over remainder of area, entire surface covered with small hair-like spicules; proctiger long, paraproct pigmented and bluntly pointed at apex, cercal setae absent; phallosome with aedeagus divided into 2 lateral plates which are connected basally, each plate with several long longitudinal lateral teeth with tergally curved apices and covered with a very lightly pigmented dorsal flap which bears scattered hair-like spicules on the sternal surface,

paramere long, approximately 0.80 length of lateral plate, parameral apodeme broad basally and tapering into a long narrow distal arm; sternum IX large, entire surface covered with minute spicules, several bristles near center of posterior margin.

PUPA. *Cephalothorax.* Hair 6-C single or double and small; 7-C double and very long. *Respiratory trumpet.* Moderately pigmented with numerous hair-like spicules on inner surface; index 2.55 - 4.00. *Abdomen.* Hairs 1-I with 17-34 branches on basal 0.33, 1-II with 5-14 branches, 1-III double to 7 branched; 5-I single to 4 branched, 5-II,III double to 7 branched, 5-IV-VI single to double, 5-VII single to 4 branched; 6-VII with 4-11 branches; 9-I-VI single, 9-VII well developed, double to 7 branched, 9-VIII well developed, 4-20 branched. *Paddle.* Elliptical in shape; with minute spicules on distal 0.50 and minute serrations on basal 0.50 of outer margin; midrib reaches and occasionally somewhat projects beyond apical margin of paddle; hair 1-P long, stout, with apical portion smoothly recurved, single; index 1.36 - 1.92.

LARVA. *Head.* Mouth brushes normal, non-pectinate; hairs 4-7-C long and barbed; 4-C with 5-15 branches; 5-C with 5-16 branches; 6-C with 6-12 branches; 7-C with 9-17 branches; 8, 9, 11-14-C stellate; 8-C single to 9 branched; 9-C with 5-17 branches; 10-C stellate or barbed, double to 4 branched; 11-C with 15-22 branches; 12-C double or triple; 13-C with 4-7 branches; 14-C with 4-14 branches; 15-C double or triple; basal maxillary hair stellate, triple to 7 branched; mental plate with 21-29 teeth. *Antenna.* Long, slightly incurved, lightly pigmented, short stout spicules scattered over entire shaft, most numerous on basal 0.50; hair 1-A moderately long, barbed, 5-8 branched, inserted 0.39 - 0.47 from base; 2-A very long; 3-A short, 0.18 - 0.33 length of 2-A; 4-A long, 0.49 - 0.72 length of 2-A; 5-A short, flat; 6-A short, conical in shape. *Thorax.* Hairs 0, 1, 8, 9-P stellate, 3-P barbed or stellate, 4-7-P barbed; 1, 13, 14-M stellate, 3, 5-10, 12-M barbed; 1, 3, 8, 13-T stellate, 7, 9, 10, 12-T barbed. *Abdomen.* Hairs 1-I-VIII, 2, 4, 13-I-VII, 3, 6, 8-VII, 7-II-VI, 10-VI, VII and 11-I stellate; 1-X, 2, 4-VIII, 3-II, VIII, 5-II-VIII and 6-I-VI, VIII barbed, 1-X long, stout, single to 5 branched and inserted at middle of posterior margin of the saddle; 2-X moderately long, 6-13 branched; 3-X long, single; comb with 19-36 scales arranged in 2 rows, posterior row shorter with less than 1/3 of the scales, each scale with a long, stout, pointed, median spine with short, stout denticles laterally on basal 0.75; saddle heavily pigmented, incompletely rings segment X, with numerous short, stout, heavily pigmented spicules scattered over entire surface, spicules large along entire posterior margin, acus absent; ventral brush with 7-8 hairs on grid and no precratal ones, anterior 2 hairs very short and single or occasionally double, following 2 hairs moderately long and single or double, remaining hairs long and double to 4 branched; 4 anal papillae, moderately long and narrow with bluntly rounded apices. *Siphon.* Heavily pigmented, very dark beyond middle with basal 0.45 and apical 0.10 paler, basal 0.50 - 0.60 covered with small short ridges of spicules; index 3.30 - 5.00; pecten composed of 5-12 evenly spaced teeth with lateral denticles and on basal 0.43 of siphon; hair 1-S long, barbed and multiple branched, base inserted distal to last pecten tooth and 0.38 - 0.50 from base of siphon; hair 2-S short, stout, heavily pigmented with apex recurved.

EGG. Not known.

DISTRIBUTION. Only 2 species of *Ayurakitia* are known and they have been collected from valleys in mountainous areas of western Thailand. The range of the subgenus may well extend into the mountain ranges of eastern Burma and northern Malaysia since similar habitats and climates occur in these areas.

The known distributions of *peytoni* and *griffithi* are plotted on the map in Figure 1.

TAXONOMIC DISCUSSION. The subgenus *Ayurakitia* possesses characters in the female, male, pupa and larva that allows it to be separated from the other subgenera of *Aedes*. The most striking characteristic is the absence

of postspiracular bristles in the adults which is unusual for the genus *Aedes* and is found elsewhere only in the North American monotypic subgenus *Kompia* Aitken. However, these 2 subgenera differ in many features in all stages. *Kompia*, for example, has the adults with a few posterior acrostichal bristles; prealar knob with numerous bristles; mesepimeron without lower bristles; broad silvery scale patches on the following areas -- antepronotum, postpronotum, postspiracular, subspiracular and prosternum; male maxillary palpus much like that of *Aedimorphus* Theobald, *Ochlerotatus* Lynch Arribalzaga, *Aztecaedes* Zavortink, *Protomacleaya* Theobald, *Abraedes* Zavortink and some *Finlaya* Theobald; male genitalia with the aedeagus composed of a simple tube, basal mesal lobe developed into a claspette with a large flattened, curved bristle at apex, proctiger with cercal setae, and gonostylus long, narrow with an apical gonostylar claw; pupae with abdominal hairs 9-II-VI well developed into stout, heavily pigmented bristles; larvae with the ventral brush of abdominal segment X with 13-14 hairs, anterior 1-2 hairs short, single to triple and anterior to grid, posterior 2 hairs short with 11-14 branches, remainder of hairs long with 1-4 branches; larval antenna short and with only a few minute spicules; larval head hair 4-C multiple, short mesad and even with 6-C, 5-C directly posterior to 6-C, 5-C and 6-C long and single, 7-C with 4-8 branches. *Kompia* shows the closest relationship to *Abraedes*, especially in the larval and pupal stages, and does not appear to be related to *Ayurakitia*.

Other important features of the adults of *Ayurakitia* are: head with vertex covered with decumbent broad scales and a band of overlapping silvery scales around the dorsal margins of the eyes; numerous erect forked scales on occiput and vertex; scutum with acrostichal bristles absent, dorsocentral (anterior and posterior) bristles well developed and mesepimeron with 1 lower bristle in the male and 2 lower ones in the female; and posttarsi of females each with 2 ungues, I and II with ungues equal in size and each with a tooth and III with ungues equal in size and simple. These characteristics may be shared in part, but not in combination, by other subgenera of *Aedes*. The structure of the male palpus of *Ayurakitia* has a striking resemblance to that of members in the subgenus *Diceromyia* Theobald.

Female genitalia of *Ayurakitia* are similar to those of *Aedes nummatus* Edwards, *Udaya* Thurman and *Aedes* subgenera *Diceromyia* and *Stegomyia* Theobald. They can be separated from these, however, by the deep median indentation of the postgenital plate and the presence of long thin bristles on the insula.

Male genitalia of *Ayurakitia* are most similar to those of *Aedes nummatus* which is being transferred from *Aedimorphus* to *Diceromyia* (Reinert *in press*). The aedeagus is similarly developed in both *nummatus* and *Ayurakitia* especially the dorsal flap which possesses hair-like spicules on the sternal surface. A similar aedeagus with a dorsal flap is found in *Udaya*, *Aedes* subgenera *Diceromyia*, *Aedimorphus* and *Stegomyia meronephada* (Dyar and Shannon) and *vittatus* (Bigot), but these all lack the spicules sternally on the dorsal flap. Development of the parameres of the phallosome in *Ayurakitia* resembles that of the subgenera *Diceromyia*, *Aedimorphus* and *Neomelaniconion* Newstead and the parameral apodemes are similarly developed in *nummatus* and *Aedimorphus*. The proctiger of *Ayurakitia* resembles that of *nummatus*, *Aedes (Neomelaniconion)*, *Aedes (Aedimorphus) vexans* Group, and some *Aedes (Stegomyia)* in being long, narrow and bluntly pointed apically but can be separated from the first 2 by the lack of apical teeth. The apically expanded gonostylus is superficially like *Aedimorphus*, some *Diceromyia* and *vittatus* and the gonocoxite is long, narrow, without lobes and with modified bristles on the sternomesal margin resembling conditions found in some *Finlaya* and *Diceromyia*. Genitalia of *Ayurakitia* can be separated from those of all the other subgenera of *Aedes* by the shape of tergum IX, development of the basal mesal lobes, and a combination of the other features mentioned above especially the development of the phallosome.

The most distinctive features of the pupae of *Ayurakitia* taken singularly or in combination separates this subgenus from the other subgenera of *Aedes*. These features are: cephalothoracic hair 7-C bifid and very long, approximately equal in length to the width of abdominal segment VIII; hair 6-C small; abdominal hairs 5-IV-VI very long, each equal to or exceeds the combined length of the following 2 abdominal segments; abdominal hairs 9-VII, VIII well developed and barbed, 9-VII double to 7 branched, 9-VIII with 4-20 branches; and paddle elliptical in shape, midrib reaching and somewhat projecting beyond apical margin and hair 1-P single with apical portion smoothly recurved into a hook.

Larvae of *Ayurakitia* are distinguished from other subgenera of *Aedes* by the following combination of characters: head hairs 4, 5, 6, 7-C multiple branched, well developed and approximately equal in length, 4-C with branches slightly shorter than 5, 6, 7-C; 5-C posterior in position to 6-C and posterior and mesal to 7-C; 4-C mesad and equidistant from 5-C and 6-C; 7-C posterior and slightly mesad to base of antenna; antenna long with numerous stout spicules scattered over entire surface; antennal hair 1-A multiple branched, barbed and branches extend beyond apex of antennal shaft; head, thorax and abdomen with numerous stellate hairs, this feature, however, is shared by many species of mosquitoes that breed in water in plant-containers; and development of the ventral brush on abdominal segment X. The head hair arrangement and development are similar to some species of *Diceromyia* in Africa but these species can be distinguished from *Ayurakitia* on other characters mentioned in the subgeneric description.

MEDICAL IMPORTANCE. Nothing is known about the medical significance of the species in the subgenus.

BIOLOGY. The larval habitat is water in small plant-containers. Immatures have been collected from clear or colored fresh water in small and large *Pandanus* axils, banana axils and bamboo internodes; usually in heavily or partially shaded areas located in primary and secondary rain forests, secondary deciduous forests, rubber plantations, bamboo groves and once each from a secondary open swamp and a rice field; sites were in valleys located in mountainous areas. Larvae have been collected in association with those of several species of *Aedes, Anopheles, Culex, Malaya, Orthopodomyia, Topomyia* and *Tripteroides* that inhabit the water found in *Pandanus* and banana axils and bamboo internodes.

Adults have been collected resting on tree trunks and vegetation in jungle valleys located in mountainous areas.

KEYS TO THE SPECIES OF *AEDES (AYURAKITIA)*

ADULTS

Occurring in mountains of Thailand south of the Isthmus of Kra . . . . . *peytoni*

Occurring in mountains of Thailand north of the Isthmus of Kra . . . . . *griffithi*

MALE GENITALIA

Tergum IX bilobed with 4-6 bristles on each lobe; basal mesal lobe with 10-12 short bristles on distal 0.50 in addition to 2 long subapical ones . . . . . *peytoni*

Tergum IX bilobed with 1-3 bristles on each lobe; basal mesal lobe with 6-9 short bristles on distal 0.50 in addition to 2 long subapical ones . . . . . *griffithi*

PUPAE

Abdominal hair 9-VIII with 4-8 branches; abdominal hairs 5-IV, VI single . . . . . *peytoni*

Abdominal hair 9-VIII with 13-20 branches; abdominal hairs 5-IV, VI double . . . . . *griffithi*

FOURTH STAGE LARVAE

Head hair 5-C with 5-9 branches; prothoracic hair 9-P with 9-17 branches; abdominal hair 1-X single or double . . . . . *peytoni*

Head hair 5-C with 11-16 branches; prothoracic hair 9-P double to 5 branched; abdominal hair 1-X with 4-5 branches . . . . . *griffithi*

AEDES (AYURAKITIA) PEYTONI NEW SPECIES

(Figs. 2, 3, 4, 6, 8, 10)

FEMALE (Fig. 2). *Head.* Antenna dark brown, approximately 0.85 length of proboscis, pedicel light brown with a few small broad brown scales and a few short brown hairs mesally, flagellomere 1 with basal 0.85 pale brown with a few small brown scales; clypeus brown, bare; maxillary palpus brown scaled, approximately 0.18 length of proboscis; proboscis golden scaled with basal 0.07 and apical 0.30 dark brown scaled, a median dorsal longitudinal dark brown scaled stripe from base to apex and a few brown scales scattered over ventral surface, approximately 1.05 length of femur I; vertex covered with broad decumbent golden scales with a band of overlapping broad silvery scales around the margin of the eyes, band is separated in the middle by a small triangular patch of broad brown scales; lateral surface covered with broad golden scales; occiput with narrow curved golden scales; numerous dark brown erect forked scales on occiput and vertex extending anteriorly to the silvery band of scales. *Thorax.* Scutal integument orange-yellow colored; scutum covered with narrow curved reddish-black scales with prescutellar space bare; scutellum with a small patch of narrow curved reddish-black scales on each lobe in addition to a few broad reddish-black scales on median lobe; median anterior promontory, acrostichal, dorsocentral (anterior and posterior), scutal fossal (3-4 anterior, 2 lateral and 1 posterior), 17-21 supra-alar, 1 postalar callar and scutellar (3 long and 1-2 short lateral and 4 long and 1 short median) bristles reddish-black and well developed; pleural integument orange-yellow; antepronotum with 9-10 dark bristles; postpronotum with 2 posterior dark bristles, upper one short and lower one long; propleuron with a patch of overlapping broad silvery scales, 4-5 dark and golden bristles; paratergite, postspiracular and subspiracular areas bare; mesepisternum with an upper and a posterior patch of broad overlapping silvery scales, 1 moderately long upper and 1 long dark and 5-6 short golden lower bristles; prealar knob with 3 short dark bristles; mesepimeron with a patch of overlapping broad

silvery scales on upper area, a small patch of 7-8 short dark and golden bristles on upper area, 2 bristles on lower anterior area, upper one short and golden and lower one long and dark; other pleural areas bare. *Legs*. Coxae I-III each with several brown and golden bristles, I with broad brown scales on anterior surface and a patch of broad golden scales dorsally, II, III each with broad golden scales anteriorly and a small lower posterior patch of brown scales; trochanters I-III each with a few short dark bristles, a patch of broad golden scales and a small spot of broad brown scales; femora I-III each brown scaled with an anterodorsal silvery scaled spot at apex, a basal golden scaled band and a longitudinal golden stripe on anterior surface, stripe becomes narrower distally and is located dorsally on I and ventrally on II and III, II and III also with a dorsal silvery scaled spot which extends onto anterior and posterior surfaces and is located 0.30 from apex, posterior surface of I and II golden scaled with a longitudinal brown stripe which is ventral and on apical 0.75 of I and dorsal and on apical 0.70 of II, I also with a small posterodorsal silvery scaled spot at apex, III with posterior surface brown scaled with a ventral patch of golden scales extending from base to middle, patch broad at base and tapering to a point distally; tibiae I, II each dark brown scaled with a posteromedian longitudinal golden stripe from base to apex, II also with a ventrobasal golden spot, III dark brown scaled with a posteromedian golden stripe extending from basal 0.30 to distal 0.25, also a basal golden spot ventrally and extending dorsally onto anterior and posterior surfaces; tarsi I-III dark brown scaled, I with basal white bands on tarsomeres 1, 2, a posteroventral white longitudinal stripe on basal 0.50 of tarsomere 1, II with broad basal white bands on tarsomeres 1-3, a posteroventral white longitudinal stripe on tarsomere 1 and basal 0.50 of tarsomere 2, III with broad basal white bands on tarsomeres 1-4; posttarsi I-III each with 2 ungues, I, II each with ungues equal and each with a tooth, III with ungues equal and simple. *Wing*. Dorsal and ventral veins covered with brown scales; costa with golden scales on basal 0.25 of its posterior margin dorsally and ventrally; alula with moderately broad brown scales along fringe; upper calypter with 13-21 hairs; 2 remigial bristles. *Halter*. Pedicel pale, capitellum brown scaled. *Abdomen*. Terga dark brown scaled, I with a rectangular patch of silvery scales on laterotergite, II-VII each with a median silvery scaled spot on lateral surface, VIII with a dorsobasal silvery scaled spot, II with a dorsobasal narrow golden scaled band and a few brown scales intermixed with golden ones, III, IV each with a dorsobasal broad golden band and a pair of indistinct dorsal admedian golden scale patches, V, VI each with a broad dorsobasal golden band which is narrow medially and broad laterally, dorsolateral margins of this band extend to posterior margins of terga; sterna each golden scaled with a narrow apical brown scaled band, brown band broader mesally and does not reach lateral margins on VI, VII; terga and sterna with numerous golden bristles, mostly along posterior margins. *Genitalia* (Fig. 4). Tergum VIII 0.85 retracted into segment VII and visible dorsally, apex broad and only slightly rounded apically; sternum VIII with a small median apical indentation; tergum IX with 2 partially pigmented lateral lobes each bearing 3-4 short bristles, entire surface covered with minute setae; cerci retracted and only apical 0.20 visible dorsally, each cercus short, broad, flat and broadly rounded apically, tergal surface covered with scales, short bristles and minute spicules, 4-5 long stout bristles along lateral margin at apex, sternal surface with 4-7 short bristles along apical and distal 0.40 of outer area and minute setae scattered over entire area; postgenital plate broad, a deep median indentation forming 2 lobes, 3-5 short bristles on each lobe, entire surface covered with minute setae; posterior cowl membranous and covered with tiny setae; anterior cowl, anterior and posterior sigma each narrow and covered with minute setae; atrial plate moderately developed and lightly pigmented; insula tongue-like, membranous, covered with minute setae and with 6 long thin bristles on anterior 0.25; 3 pigmented, spherical spermathecae, 1 large and 2 slightly smaller ones.

MALE (Fig. 3). Similar to female in general habitus. *Head.* Antenna with hair tufts directed mainly dorsally and ventrally, approximately 0.84 length of proboscis; maxillary palpus with segments 1, 2, 5 brown scaled, segment 3 golden scaled with apical 0.20 brown scaled and a few brown scales near base, segment 4 brown scaled with a few golden scales laterobasally and with 4 moderately long golden bristles dorsoapically, approximately 0.35 length of segment 3, segment 5 short and downturned with golden bristles at apex, of which 3-4 are moderately long and 5-7 are short, segments 3, 4 long and approximately equal in length, overall length approximately 0.95 of proboscis; proboscis with numerous brown scales intermixed with golden ones. *Thorax.* Scutum with 1-2 lateral scutal fossal bristles and 19-22 supra-alar bristles; antepronotum with 7-9 bristles; postpronotum with 2-3 bristles; mesepisternum with 1 moderately long upper bristle and 1 long and 4-5 short lower ones; prealar knob with 3-4 bristles; mesepimeron with 5-6 bristles on upper area and only 1 lower bristle. *Legs.* Posttarsi I-III each with 2 ungues, I with ungues unequal, larger one with a tooth, II with ungues unequal and simple, III with ungues equal and simple. *Wing.* Upper calypter with 14-18 hairs. *Abdomen.* Tergum I brown with laterotergite silvery scaled; terga II-VI each with dorsal surface golden scaled with a posteromedian triangular brown scaled patch which has the apex pointing anteriorly, lateral surface brown scaled with a large median patch of silvery scales and golden scales basally; terga VII, VIII each brown scaled with a small median basal patch of golden scales and a pair of admedian silvery spots dorsally; sterna as in female except VIII which is brown scaled with a basal pair of large silvery spots. *Genitalia.* (Fig. 6). Tergum IX bilobed with 4-6 bristles on each lobe, anterior margin with a deep median indentation, entire surface covered with minute spicules; gonocoxite long and narrow, dorsal surface with scattered long and a few moderately long bristles from near base to near apex, a number of short bristles along tergomesal margin from near base to near apex, lateral and ventral surfaces with numerous scales, ventral surface with 8-11 long and moderately long bristles on distal 0.50 and 3-4 long bristles on basal 0.50, a few short bristles on basal 0.25 mainly on mesal area, 2 irregular rows of 14-20 stout moderately long bristles on sternomesal margin near middle, entire surface covered with minute spicules; gonostylus with pedicel short and moderately broad, distal 0.73 expanded into a large bluntly pointed lateral lobe with a short seta at apex and a slightly longer, narrow mesal arm which is bulbous distally with an apical flattened gonostylar claw with apex blunt and recurved, lateral lobe with distal 0.80 covered with short and long hair-like spicules, 11-19 short setae scattered over sternal surface, 1-4 similar setae on tergal surface near apical margin and 3-5 short setae on tergal surface near base of mesal arm; basal mesal lobe with basal 0.50 attached to mesal margin of gonocoxite and distal 0.50 produced as a lobe with 2 long subapical bristles, 9-11 short bristles scattered over remainder of distal 0.50 and 1 short bristle on a small tubercle near middle of mesal margin, entire surface covered with small hair-like spicules; proctiger long, paraproct pigmented and bluntly pointed apically, cercal setae absent; phallosome with aedeagus with 2 lateral plates connected basally, each plate with 9-10 long, lateral teeth with tergally curved apices and covered with a very lightly pigmented dorsal flap which has scattered hair-like spicules on sternal surface, paramere long, approximately 0.80 length of lateral plate, parameral apodeme broad basally and tapering into a long narrow distal arm; sternum IX large, entire surface covered with minute spicules, 2 bristles near center of posterior margin.

PUPA (Fig. 8). Chaetotaxy as figured and recorded in Table 1. *Respiratory trumpet.* Moderately pigmented; numerous hair-like spicules on inner surface; index 3.55 - 4.00, average 3.81. *Abdomen.* Hairs 5-IV, VI very long and single; 5-V very long and usually single, double in one specimen; 9-VII well developed and barbed, double to 4 branched; 4-VIII single and occasionally double; 9-VIII well developed and barbed, 4-8 branched. *Paddle.* Elliptical in shape; with minute serrations on basal 0.50 and minute spicules on

distal 0.50 of outer margin; midrib reaches and somewhat projects beyond apical margin of paddle; hair 1-P long, stout, with apical portion smoothly recurved, single; index 1.58 - 1.92, average 1.73.

LARVA (Fig. 10). Chaetotaxy as figured and recorded in Table 3. *Head.* Hair 4-C long and barbed with 5-7 branches; 5-C long and barbed with 5-9 branches; 6-C long and barbed with 6-9 branches; 14-C stellate with 7-14 branches; basal maxillary hair stellate with 5-7 branches; mental plate with 25-29 teeth, usually with 26 teeth. *Antenna.* Hair 1-A attached 0.39 - 0.42 from base. *Thorax.* Hair 0-P stellate with 18-25 branches; 1-P stellate with 16-21 branches; 5-P barbed and double; 9-P stellate with 9-17 branches; 1-M stellate with 20-26 branches; 4-M barbed and single; 14-M stellate with 19-27 branches; 1-T stellate with 20-31 branches; 3-T stellate with 19-28 branches. *Abdomen.* 1-I stellate with 23-34 branches; 2-I stellate with 13-17 branches; 4-I stellate with 16-18 branches; 6-I barbed with 6-7 branches; 10-I single; 1-II stellate with 19-27 branches; 2-II stellate with 13-19 branches; 4-II stellate with 17-24 branches; 13-II stellate with 17-24 branches; 1-III stellate with 20-25 branches; 2-III stellate with 10-17 branches; 4-III stellate with 16-20 branches; 7-III stellate with 17-20 branches; 13-III stellate with 15-19 branches; 1-IV stellate with 24-28 branches; 2-IV stellate with 11-16 branches; 4-IV stellate with 18-22 branches; 7-IV stellate with 20-24 branches; 13-IV stellate with 14-20 branches; 1-V stellate with 22-30 branches; 2-V stellate with 12-16 branches; 4-V stellate with 18-22 branches; 7-V stellate with 16-23 branches; 13-V stellate with 14-19 branches; 1-VI stellate with 19-30 branches; 2-VI stellate with 13-23 branches; 4-VI stellate with 20-27 branches; 7-VI stellate with 15-19 branches; 10-VI stellate with 9-12 branches; 13-VI stellate with 14-17 branches; 1-VII stellate with 21-27 branches; 2-VII stellate with 14-18 branches; 3-VII stellate with 20-23 branches; 6-VII stellate with 10-15 branches; 8-VII stellate with 18-25 branches; 10-VII stellate with 7-14 branches; 13-VII stellate with 10-13 branches; 1-X long, barbed usually double with one branch long and second branch approximately half as long, occasionally long and single and once long and triple; 2-X moderately long with 6-9 branches; comb with 28-36 scales arranged in 2 rows. *Siphon.* Index 4.38 - 5.00.

TYPE DATA. Type series includes holotype female, allotype and paratypes (9 females, 10 males, 26 whole larvae). *Aedes (Ayurakitia) peytoni,* holotype female with associated larval and pupal skins, THAILAND, *Phangnga,* Sip Si Hon (approximately 5 miles north of Rhung Nga), 20 October 1966, E. L. Peyton collector, collection number 01782-1, SEAMP accession number 84, collected as a larva from colored water in an unshaded large *Pandanus* axil located in a rice field in a valley between mountains at an altitude of 100 feet; allotype male with associated pupal skin, THAILAND, *Phangnga,* Sip Si Hon, 20 October 1966, E. L. Peyton collector, collection number 01781-103, SEAMP accession number 84, collected as a pupa from colored water in an unshaded large *Pandanus* axil located in a secondary rain forest in mountainous terrain at an altitude of 100 feet; paratype 1 whole larva, same data as holotype, collection number 01782; paratypes 2 males with associated pupal skins, collection number 01781-104 and 01781-106 and 3 whole larvae, collection number 01781, same data as allotype; paratypes 2 females with associated larval and pupal skins, collection numbers 01699-6, 01699-12, 1 female, collection number 01699-11, and 2 whole larvae, collection number 01699, THAILAND, *Phangnga,* Pathum, 15 October 1966, Kol Mongkolpanya collector, collected as larvae from colored water in an unshaded large *Pandanus* axil located in a rubber plantation in a valley of mountainous terrain at an altitude of 150 feet; 3 males with associated pupal skins, collection numbers 01701-100, 01701-101, 01701-104 and 1 whole larva, collection number 01701 with same data as collection number 01699 except E. L. Peyton collector; paratypes 3 females and 1 male with associated larval and pupal skins, collection numbers 01704-2, 01704-3, 01704-4, 01704-5, 1 male, collection number 01704-17, 12 whole larvae, collection number 01704, 1 female with associated larval and pupal

skins, collection number 01700-1 and 1 whole larva, collection number 01700, same data as collection number 01699 except Somboon Maneechai collector; paratype 1 male with associated pupal skin, same data as allotype except Kol Mongkolpanya collector, 18 October 1966 and at an altitude of 220 feet; paratypes 1 male with associated larval and pupal skins, collection number 01820-1 and 2 whole larvae, collection number 01820, same data as allotype except locality Nam Tai, 22 October 1966, Kol Mongkolpanya collector, and at an altitude of 450 feet; paratypes 1 male and 1 female with associated larval and pupal skins, collection numbers PG 1-30, PG 1-32, THAILAND, *Phangnga,* Ampur Tye Murng, 33 km from Tha Gua Pha, 5 October 1964, E. L. Peyton, Kol Mongkolpanya and Sumeth Chunchunchem collectors, collected as larvae from water in a *Pandanus* axil 6 feet above ground surface in a dense secondary growth on a mountain side 400 yards from Andaman Sea at an elevation of 245 feet; paratypes 1 female with associated larval and pupal skins, collection number TG 61-30 and 2 whole larvae, collection number TG 61, THAILAND, *Trang,* Ampur Muang, National Park at Trang, 9 October 1964, E. L. Peyton collector, collected as larvae from water in a *Pandanus* axil; paratypes 2 whole larvae, collection number 02176, THAILAND, *Ranong,* Ban Phon Rang, 19 July 1967, Kol Mongkolpanya collector, collected from water in a small *Pandanus* axil. All type material is deposited in the U.S. National Museum (Natural History), Washington, D.C., except 1 male and 1 female paratypes which will be deposited in the British Museum (Natural History), London, England and 1 male and 1 female paratypes which will be sent to Department of Entomology, SEATO Medical Research Laboratory, Bangkok, Thailand.

DISTRIBUTION. Occurs in mountainous areas of Thailand south of the Isthmus of Kra. Material examined: 11♂, 10♀, 32 L, 1 p, 2 l, 18 with associated skins (6 p, 12 l).

THAILAND. *Nakon Si Thammarat:* Ban Sai Koe; Ban Thuan Lek; Khao Luang; 5 L. *Phangnga:* Nam Tai; Pathum; Sip Si Hon; Tye Murng, Tha Gua Pha; 11♂, 9♀, 19 p, 22 L, 12 l. *Ranong:* Ban Phon Rang; 2 L. *Trang:* Muang, National Park at Trang; 1♀, 1 p, 3 L, 2 l.

TAXONOMIC DISCUSSION. The female habitus is described from the holotype and the female genitalia is from a paratype. The abdominal markings of the female paratypes are variable and some differ from the holotype. Abdominal terga II, III, V in several paratypes, have only a basal golden scaled band dorsally and no scattered golden scales or lateral extensions of the bands. Paratypes also differ from the holotype as follows: scutum with 2-3 median anterior promontory bristles and 17-24 supra-alar bristles; scutellum with 3-4 long and 1-2 short bristles on lateral lobes and 4 long and 1-2 short bristles on median lobe; antepronotum with 8-10 bristles; mesepisternum with 1 long and 4-6 short bristles in lower patch; mesepimeron with 6-8 bristles on upper area; and wing with 13-21 hairs on upper calypter.

The females of *peytoni* are very similar to those of *griffithi* and there appear to be no clear cut differences with which to separate them except geographically in that *griffithi* occupies a range in the mountains of Thailand north of the Isthmus of Kra while *peytoni* is found in the mountains south of the Isthmus of Kra. Some characters, however, have different ranges, even though the ranges partially overlap, but when used in combination serve to separate some specimens. These features are discussed under *griffithi.*

The male habitus of *peytoni* and *griffithi* are also very similar. There are, however, differences in the male genitalia as follows, in *peytoni*: tergum IX is bilobed with 4-6 bristles on each lobe; basal mesal lobe with 2 long subapical bristles and 10-12 short bristles over remainder of distal 0.50; and aedeagus composed of 2 lateral plates each with 9-10 teeth; while in *griffithi* tergum IX is bilobed with 1-3 bristles on each lobe; basal mesal lobe with 2 long subapical bristles and 6-9 short bristles over remainder of distal 0.50; and aedeagus composed of 2 lateral plates each with 7-8 teeth.

The pupa of *peytoni* has the following distinctive features: hair 9-VIII with 4-8 branches; hairs 5-IV, VI single; trumpet index 3.55 - 4.00; and paddle index 1.58 - 1.92; while *griffithi* has: hair 9-VIII with 13-20 branches; hairs 5-IV, VI double; trumpet index 2.55 - 3.44; and paddle index 1.36 - 1.52.

The larva of *peytoni* superficially resembles that of *griffithi* but can easily be separated from it by the above mentioned features. Some of the most distinctive characteristics of *peytoni* are: hair 4-C with 5-7 branches; hair 5-C with 5-9 branches; hair 8-C single to triple; hair 9-P with 9-17 branches; branching of abdominal hairs 1, 2, 4, 13-I-VII; and hair 1-X single to double; while *griffithi* larva has: hair 4-C with 9-15 branches; hair 5-C with 11-16 branches; hair 8-C with 5-9 branches; hair 9-P double to 4 branched, once 5 branched; and hair 1-X with 4-5 branches.

This species is named for Mr. E. L. Peyton in recognition of his valuable work on mosquitoes in Southeast Asia.

BIOLOGY. The immature habitat is water in small plant-containers. Immatures were collected from clear or colored fresh water in small and large *Pandanus* axils and once from bamboo internodes; in heavy, partial or unshaded areas located in primary and secondary rain forests, rubber plantations, bamboo groves, and once each from a rice field and a secondary open swamp; sites were in valleys located in mountainous areas at elevations of 33 to 1,000 feet, most often from elevations of 100 to 150 feet. Larvae were collected in association with the following species of mosquitoes: *Aedes poicilus* (Theobald), *Anopheles sintonoides* Ho, *Culex (Lophoceraomyia)* species, *Malaya genurostris* (Leicester), *Orthopodomyia albipes* Leicester, *Topomyia inclinata* Thurman and *Tripteroides aranoides* (Theobald).

AEDES (AYURAKITIA) GRIFFITHI D. THURMAN

(Figs. 3, 5, 7, 9, 11)

Ayurakitia griffithi Thurman 1954, J. Wash. Acad. Sci. 44: 198 (♂*, ♀); Thurman 1959, Univ. Md. Agri. exp. Sta. Bull. A-100, p. 75, 158 (♂*, ♀); Stone et al. 1959, Thomas Say Found. 6: 211.

Aedes (Ayurakitia) Thurman, Mattingly 1971, Contr. Am. ent. Inst. 7(4): 31 (*griffithi* not mentioned but included by implication).

The adults of *griffithi* are very similar to those of *peytoni* but some characters show a different range of values, though partially overlapping, when used in combination serve to identify some specimens. These ranges and other variable characters for the presently known adult specimens of *griffithi* (17♂, 8♀) and *peytoni* (11♂, 10♀) are listed below.

FEMALE	*griffithi*	*peytoni*
Number supra-alar bristles	18-29	17-24
Number antepronotal bristles	7-9	8-10
Number propleural bristles	4-7	4-5
Number lower mesepisternal bristles	4-6	5-7
Number upper mesepimeral bristles	5-7	6-8
Number upper calypter hairs	14-23	13-21

MALE	*griffithi*	*peytoni*
Number supra-alar bristles	15-20	19-22
Number antepronotal bristles	9-10	7-9
Number propleural bristles	4-6	5-8
Number lower mesepisternal bristles	4-9	5-6
Number prealar knob bristles	4-5	3-4
Number upper calypter hairs	17-20	14-18

The following account of the female and male of *griffithi* contains characters that shows a range of variation not seen in *peytoni*. The male genitalia, pupa and larva show characters that differ from *peytoni*.

FEMALE (Fig. 3). *Head.* Maxillary palpus brown scaled in some specimens but others have a few golden scales at base of apical segment and scattered over dorsal surface; proboscis in some specimens with only a few brown scales dorsally and without a stripe while other specimens have a definite brown dorsomedian brown stripe. *Abdomen.* Terga II-V each with a narrow dorsobasal golden scaled band, VI with a dorsobasal golden band, narrow medially and extending posteriorly along lateral margins, VII brown scaled, some specimens with a few golden scales dorsobasally, one specimen with dorsal markings similar to tergum VI, VIII with a large dorsobasal silvery scaled spot. *Genitalia* (Fig. 5). Tergum VIII 0.95 retracted into segment VII; tergum IX with 2-4 bristles on each lateral lobe; cerci with 5-6 long stout bristles along lateral margin at apex, sternal surface with 4-6 short bristles along apical and distal 0.40 of outer area; postgenital plate with 4 short bristles on each lobe.

MALE (Fig. 3). *Head.* Antenna approximately 0.75 length of proboscis; maxillary palpus approximately 0.87 length of proboscis. *Genitalia* (Fig. 7). Tergum IX with 1-3 bristles on each lobe; gonocoxite with 15-19 stout moderately long bristles on sternomesal margin; gonostylus with lateral lobe with 12-18 scattered short setae on sternal surface, 1-3 similar setae on tergal surface near base of mesal arm; basal mesal lobe with distal 0.50 produced into a lobe with 2 long subapical bristles, 5-8 short bristles scattered over remainder of distal 0.50 and 1 short bristle on a small tubercle near middle of mesal margin; phallosome with 7-8 teeth on each lateral plate of the aedeagus; sternum IX with 2-4 bristles near center of posterior margin.

PUPA (Fig. 9). Chaetotaxy as figured and recorded in Table 2. *Respiratory trumpet.* Moderately pigmented; index 2.55 - 3.44, average 3.08. *Abdomen.* Hairs 5-IV-VI very long and double; 9-VII well developed and barbed, 4-9 branched; 4-VIII double to 4 branched; 9-VIII well developed and barbed, 13-20 branched. *Paddle.* Elliptical in shape; with minute serrations on basal 0.50 and minute spicules on distal 0.50 of outer margin; midrib reaches and somewhat projects beyond apical margin of paddle; hair 1-P long, stout, with apical portion smoothly recurved, single; index 1.36 - 1.52, average 1.48.

LARVA (Fig. 11). Chaetotaxy as figured and recorded in Table 4. *Head.* Hair 4-C long and barbed with 9-15 branches; 5-C long and barbed with 11-16 branches; 6-C long and barbed with 9-12 branches; 14-C stellate with 4-7 branches; basal maxillary hair stellate and triple to 4 branched; mental plate with 21-23 teeth. *Antenna.* Hair 1-A attached 0.42 - 0.47 from base. *Thorax.* Hair 0-P stellate with 11-17 branches; 1-P stellate with 7-11 branches; 5-P barbed and triple to 4 branched; 9-P stellate and double to 5 branched; 1-M stellate with 8-13 branches; 4-M single to double; 14-M stellate with 7-10 branches; 1-T stellate with 8-11 branches; 3-T stellate with 11-17 branches. *Abdomen.* Hair 1-I stellate with 10-14 branches; 2-I stellate with 8-10 branches; 4-I stellate with 11-15 branches; 6-I barbed with 4-5 branches; 10-I double; 1-II stellate with 9-12 branches; 2-II stellate with 5-8 branches; 4-II stellate with 12-14 branches; 13-II stellate with 9-12 branches; 1-III stellate

with 10-12 branches; 2-III stellate with 4-8 branches; 4-III stellate with 12-15 branches; 7-III stellate with 12-16 branches; 13-III stellate with 7-11 branches; 1-IV stellate with 12-14 branches; 2-IV stellate with 5-8 branches; 4-IV stellate with 13-17 branches; 7-IV stellate with 12-17 branches; 13-IV stellate with 6-10 branches; 1-V stellate with 13-19 branches; 2-V stellate with 6-9 branches; 4-V stellate with 15-18 branches; 7-V stellate with 11-15 branches; 13-V stellate with 7-9 branches; 1-VI stellate with 15-18 branches; 2-VI stellate with 6-8 branches; 4-VI stellate with 16-18 branches; 7-VI stellate with 8-13 branches; 10-VI stellate with 3-4 branches; 13-VI stellate with 8-11 branches; 1-VII stellate with 16-19 branches; 2-VII stellate with 5-8 branches; 3-VII stellate with 13-19 branches; 6-VII stellate with 5-8 branches; 8-VII stellate with 10-16 branches; 10-VII stellate triple to 6 branched; 13-VII stellate with 7-10 branches; 1-X long, barbed with 4-5 branches, each branch approximately equal in length; 2-X moderately long with 10-13 branches; comb with 19-27 scales arranged in 2 rows. *Siphon.* Index 3.30 - 3.84.

TYPE DATA. *Ayurakitia griffithi* D. Thurman, holotype male, THAILAND, *Chiengmai,* Doi Sutep Mountain Range, Doi Chom Cheng Mountain, Lemmon Cabin, 4 January 1953, collector Deed C. Thurman, Jr., collected with a net while the mosquito was resting on the side of a tree growing in a damp, cool, shady mountain valley around 3,000 feet elevation, U.S.N.M. Type No. 62022; allotype, THAILAND, *Chiengmai,* Doi Sutep Mountain Range, Doi Chom Cheng Mountain, 14 February 1953, Monop Rattanopradith collector, on tree; 1 female paratype with same data as allotype; 1 male paratype with same data as allotype except Deed C. Thurman, Jr. collector; 1 female paratype same data as allotype except Tad Muey Falls added; 1 paratype male with same data as holotype; 2 male and 1 female paratypes with same data as holotype except Sapria Valley, 24 February 1953, Deed C. and Ernestine B. Thurman collectors, all the above specimens are in the U.S. National Museum (Natural History) with the exception of one of the last mentioned male paratypes and its location is unknown. One male paratype with the same data as the allotype is in the British Museum (Natural History).

DISTRIBUTION. Occurs in mountainous areas of Thailand north of the Isthmus of Kra. Material examined: 17♂, 8♀, 1 P, 17 L, 11 with associated skins (5 p, 6 l). All type material except 1 paratype was examined.

THAILAND. *Chiang Mai:* Buak Ha; Doi Sutep Mountain Range, Doi Chom Cheng Mt.; Doi Sutep Huey; 16♂, 8♀, 1 P, 10 p, 10 L, 6 l. *Kanchanaburi:* Bo Ploy, Hin-Lub Village; 1♂, 7 L, 1 p.

TAXONOMIC DISCUSSION. The male genitalia, pupa and larva are discussed and compared in the discussion section of *peytoni* and the adults are compared above.

The larva of *griffithi* tends to have more branches per hair on the head and abdominal segment X and less branches per hair on the thorax and abdominal segments I-VIII than that of peytoni.

BIOLOGY. Immatures were collected from clear fresh water in the axils of bananas and *Pandanus*; in heavily shaded areas located in secondary deciduous forests; sites were in valleys located in mountainous areas; and at an elevation of 3,920 feet in Chiang Mai Province. Larvae were collected in association with the following species of mosquitoes: *Aedes formosensis* Yamada, *Topomyia inclinata* Thurman and *aenea* Thurman. Adults were collected resting among vegetation along a stream in Chiang Mai Province by SEATO Laboratory personnel. Thurman (1954: 200) first collected this species in Chiang Mai Province as adults which were resting on tree trunks in a damp, cool, shady jungle valley in the mountains at an elevation of 3,000 feet.

ACKNOWLEDGEMENTS

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LIST OF FIGURES


BURMA
LAOS
THAILAND
CAMBODIA
Ithmus of Kra
MALAYSIA
GRIFFITHI
PEYTONI

Fig. 1

Fig.2

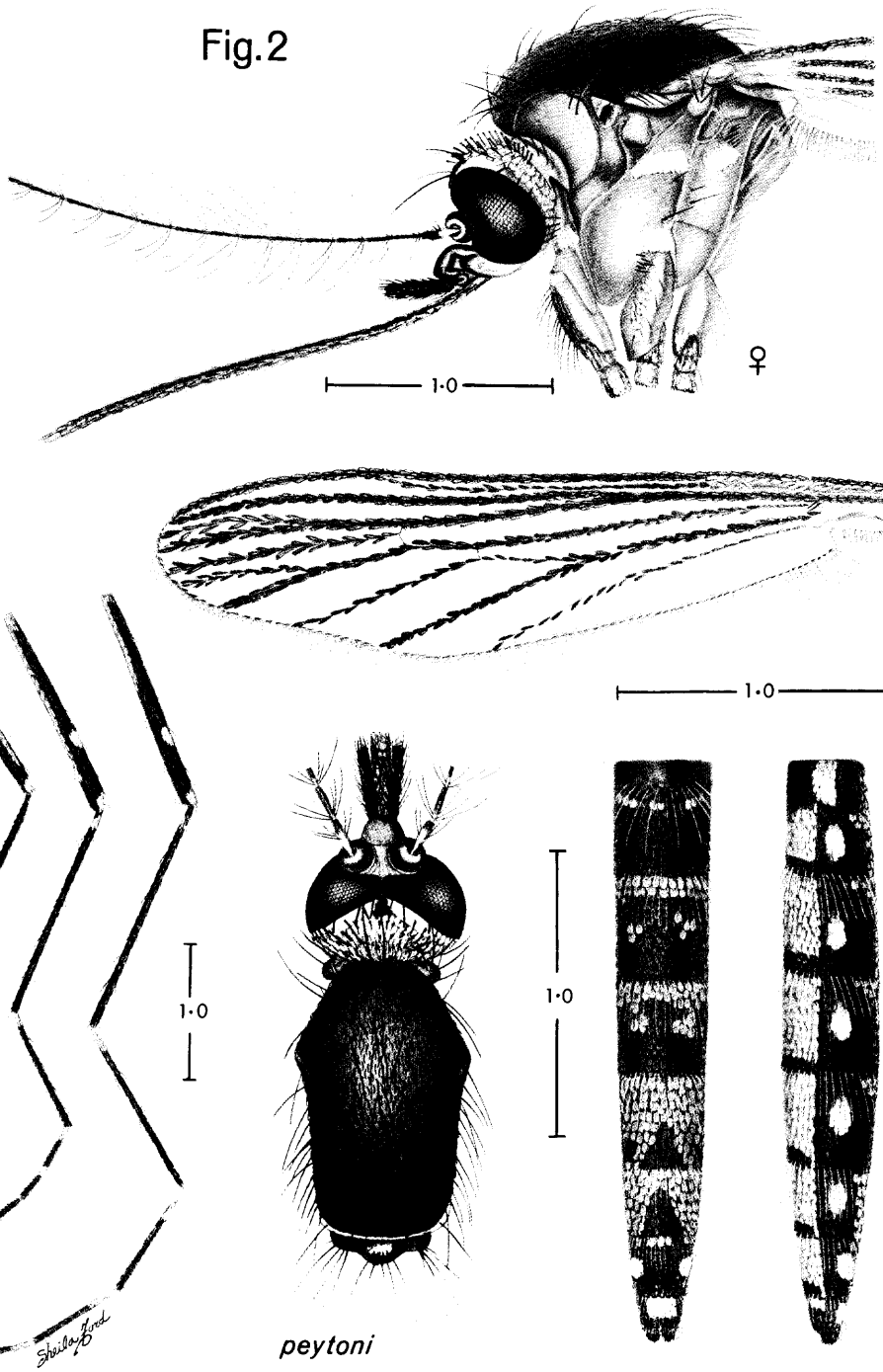
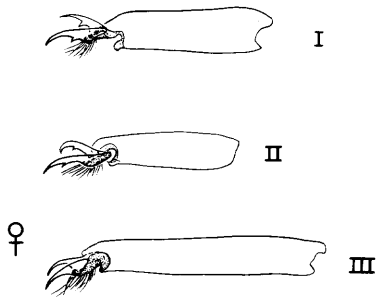


Fig. 3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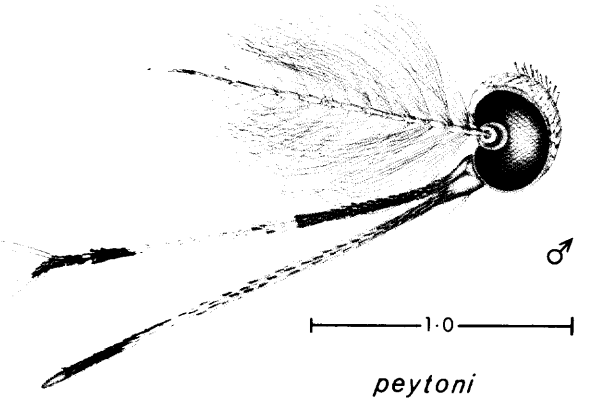
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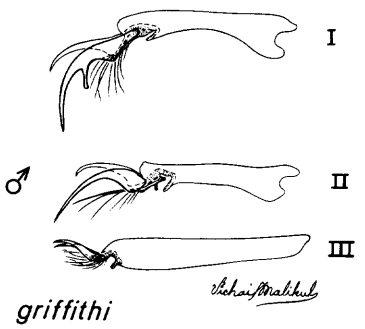
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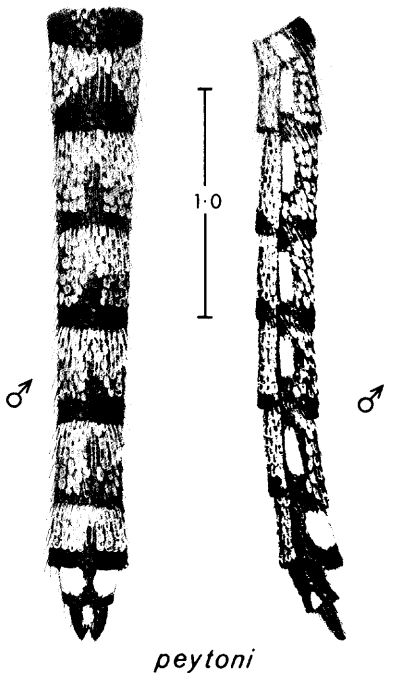
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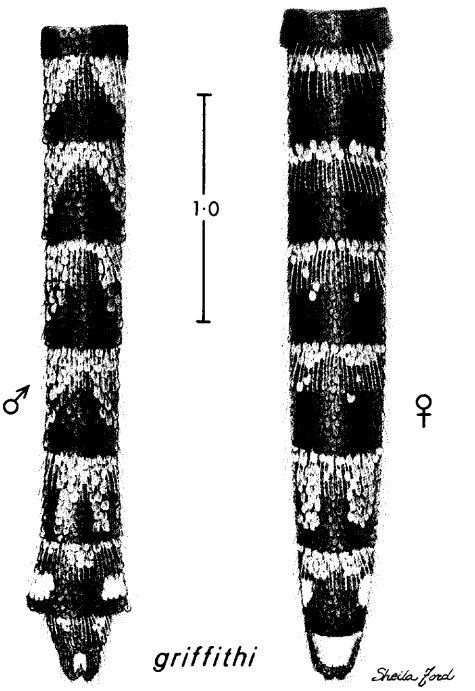
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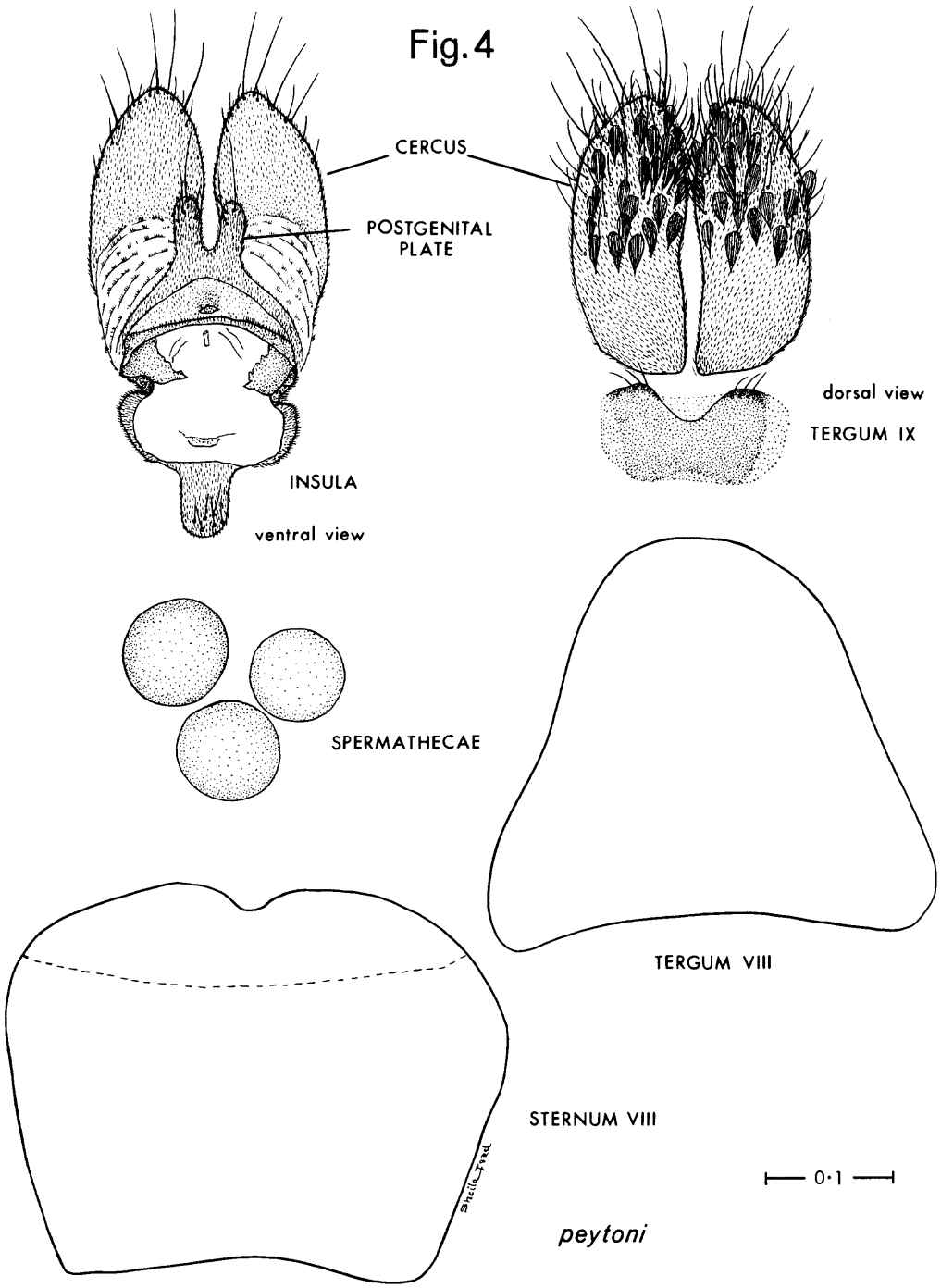
Fig. 4
CERCUS
POSTGENITAL PLATE
INSULA
ventral view
dorsal view
TERGUM IX
SPERMATHECAE
TERGUM VIII
STERNUM VIII
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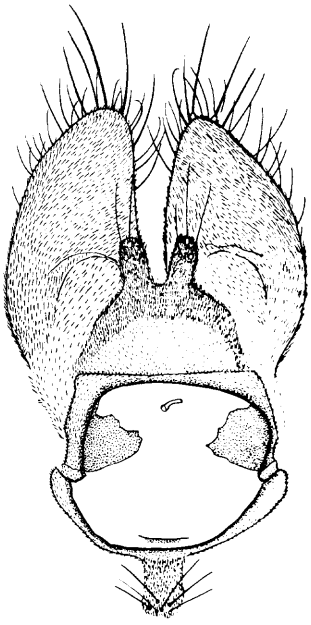
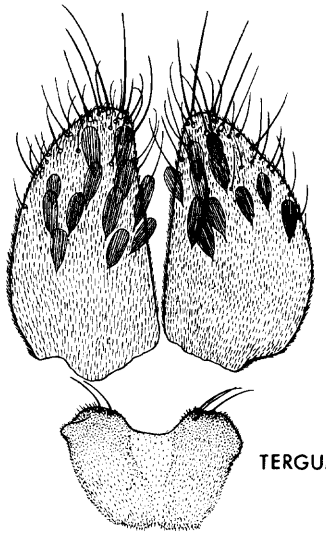
peytoni

Fig.5



ventral view



TERGUM IX

dorsal view

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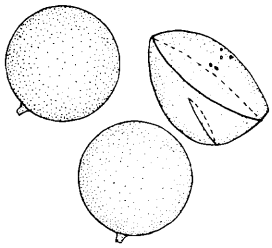

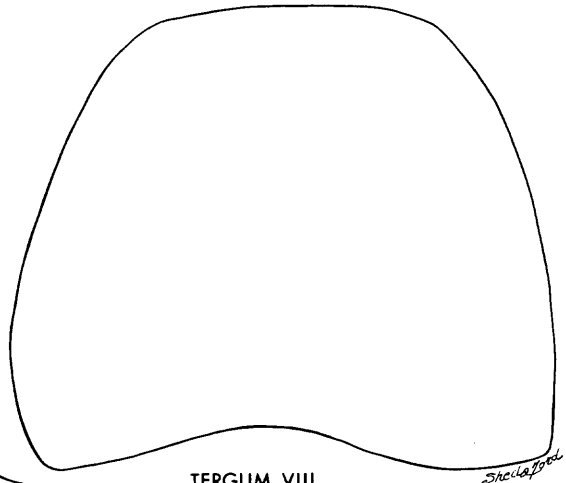

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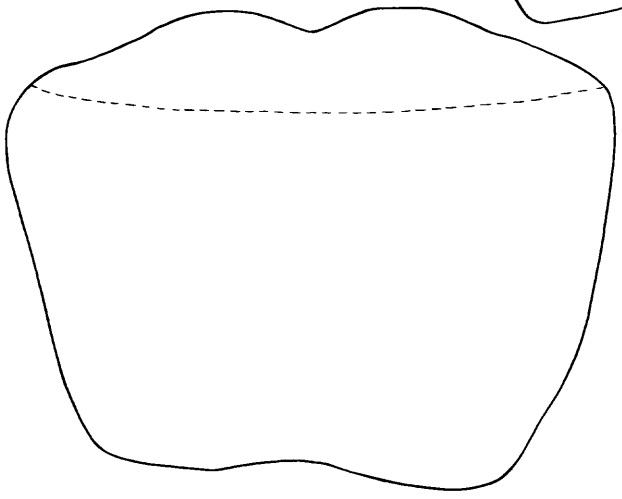
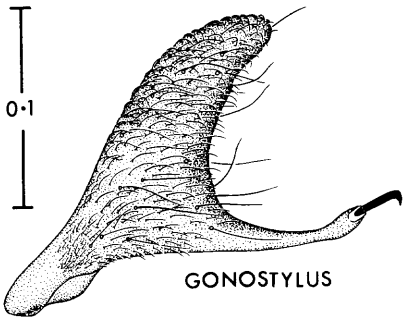


STERNUM VIII

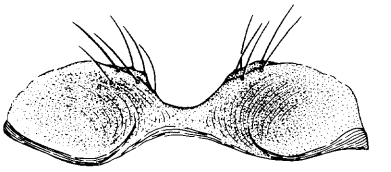
griffithi

Fig. 6



GONOSTYLUS

ventral view



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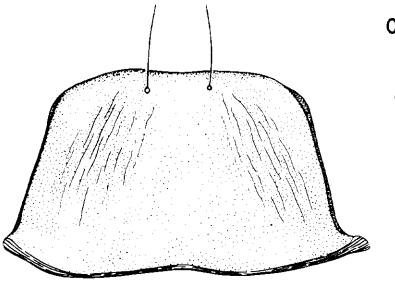

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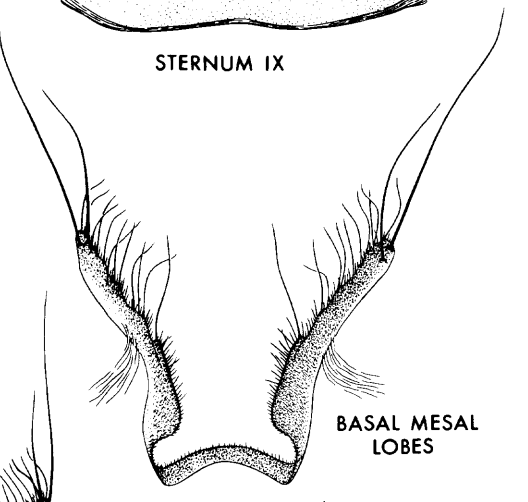

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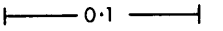
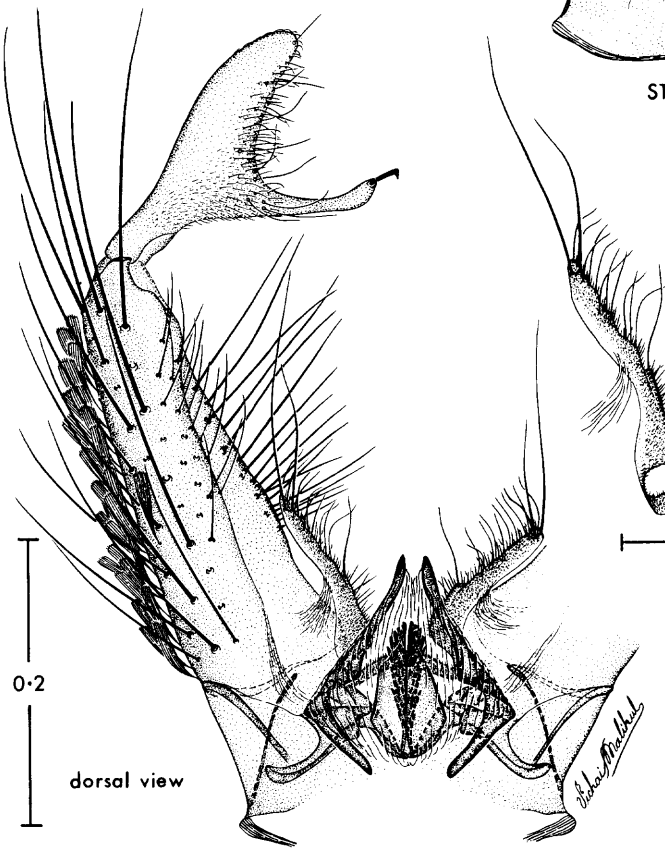
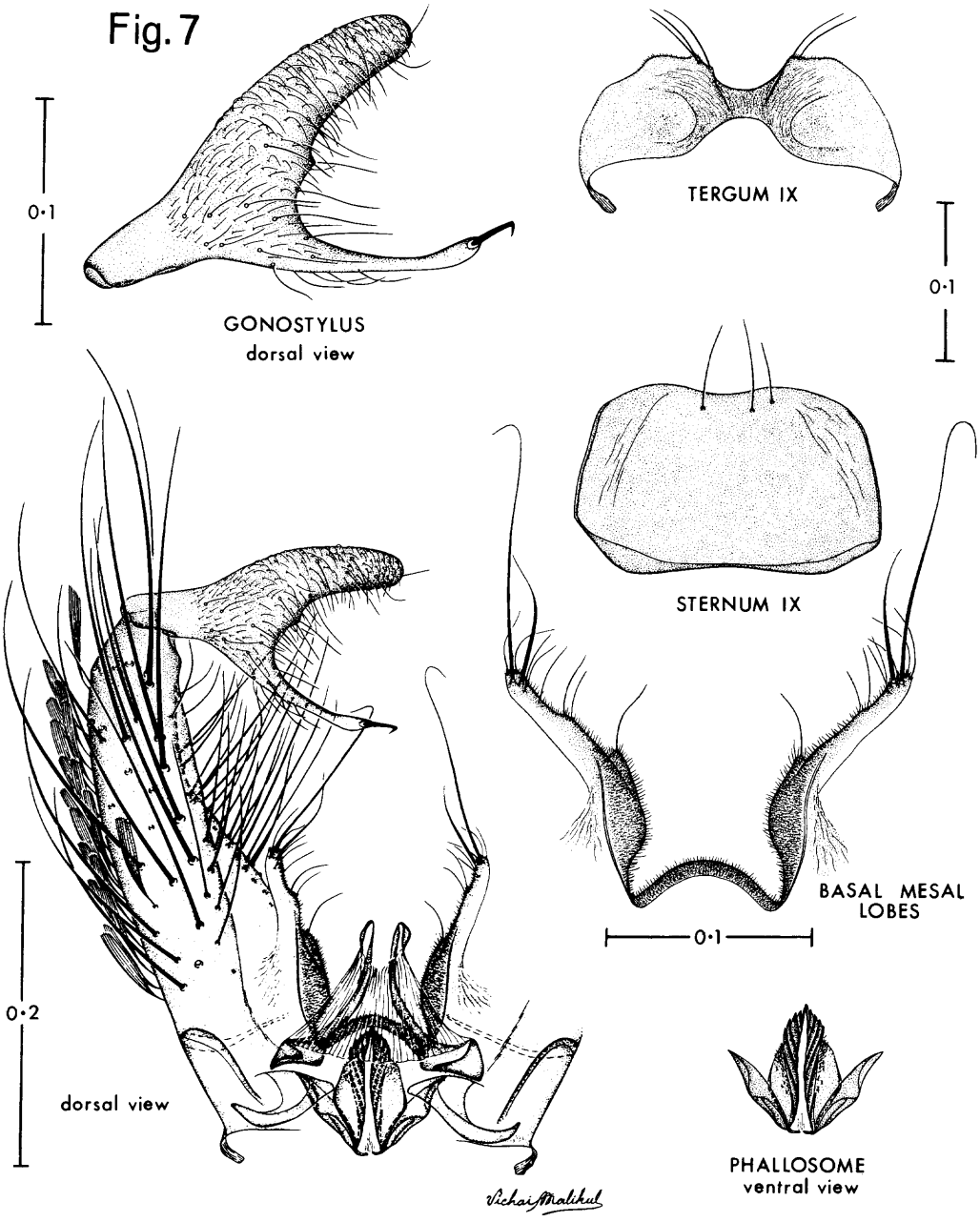




dorsal view

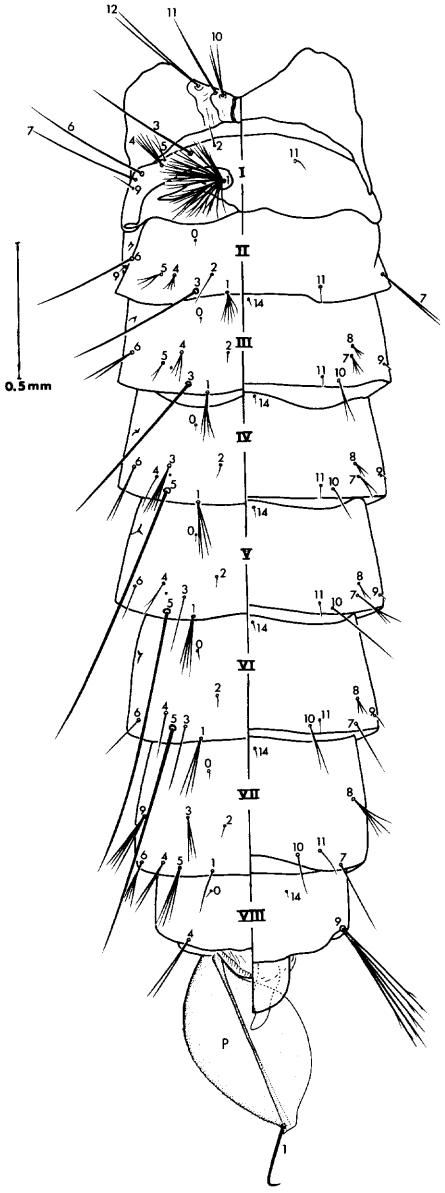
peytoni

Fig. 7

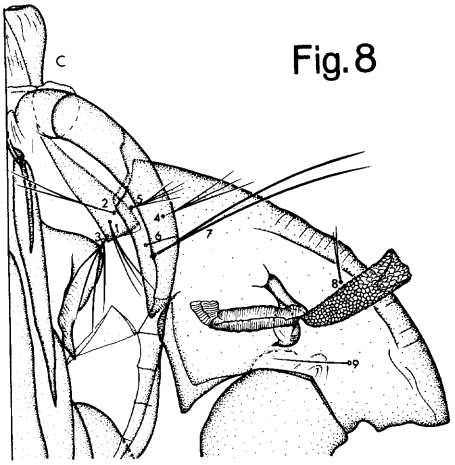


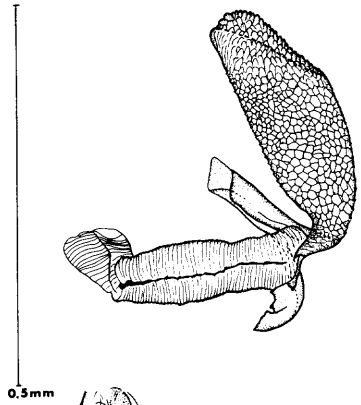
griffithi

Fig. 8



peytoni





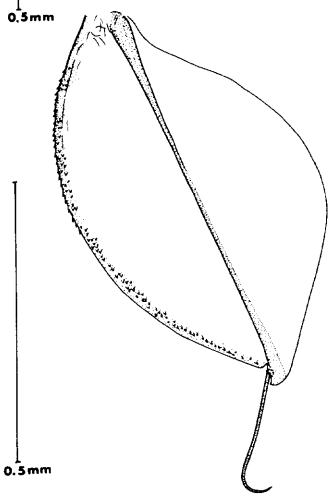


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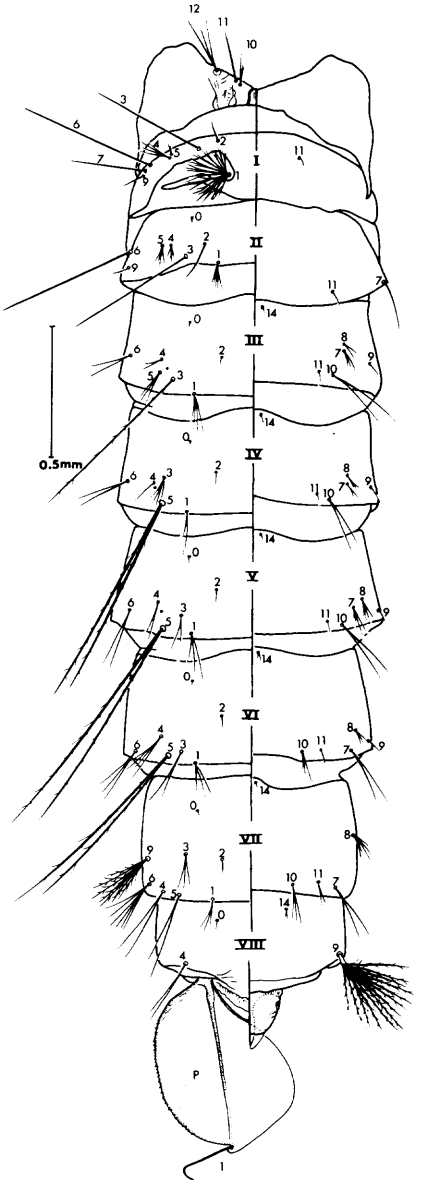
Fig. 9



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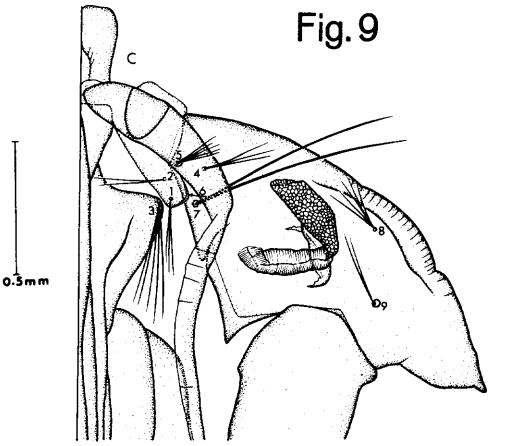

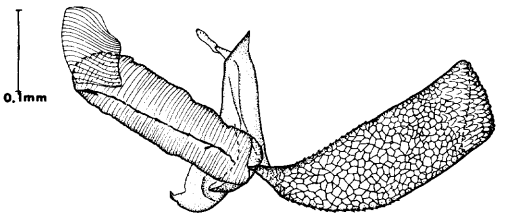

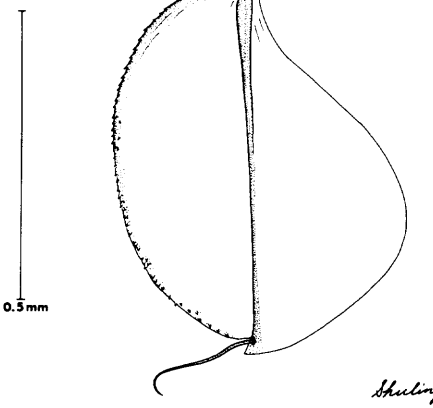

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Fig.10

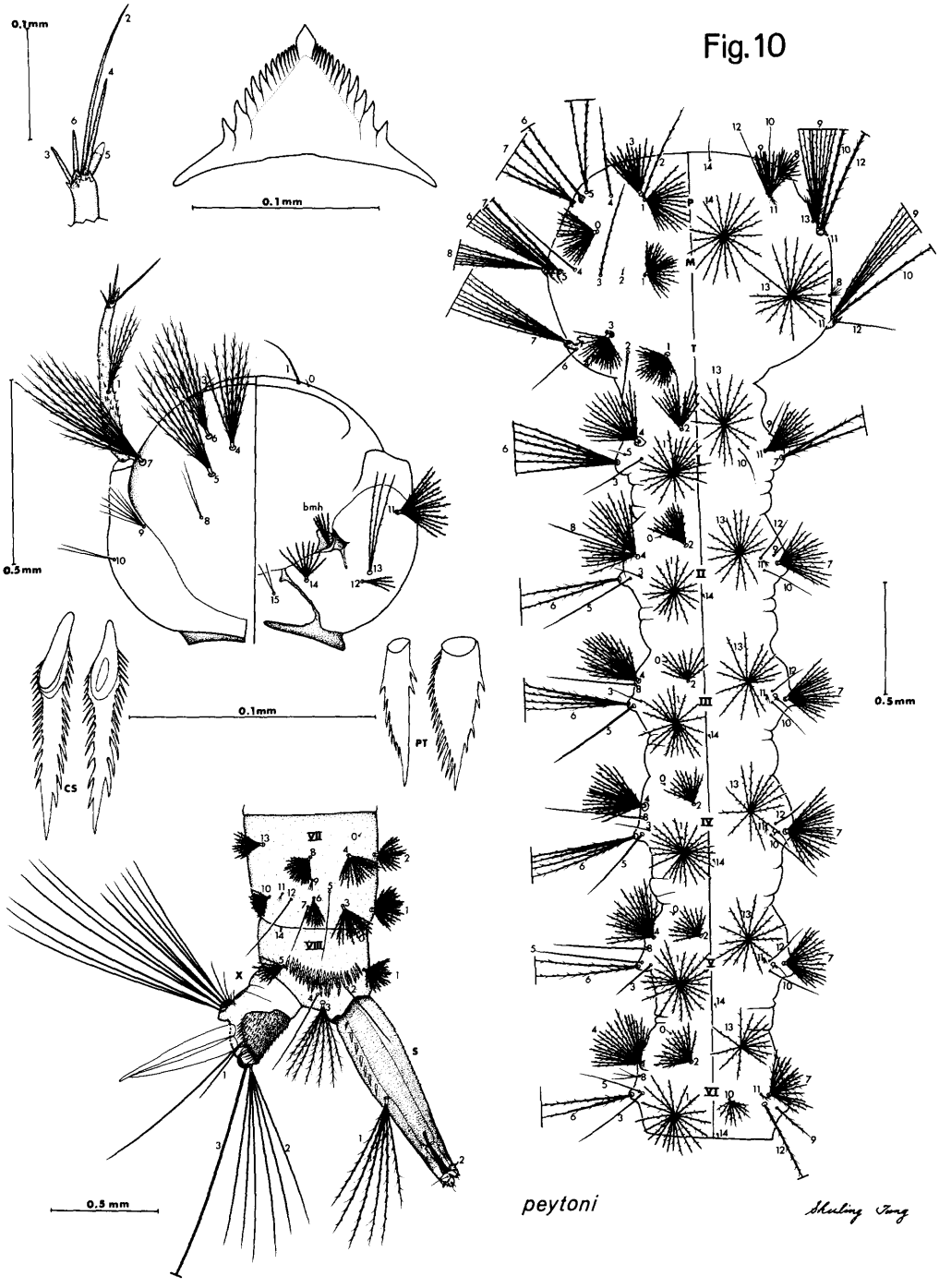
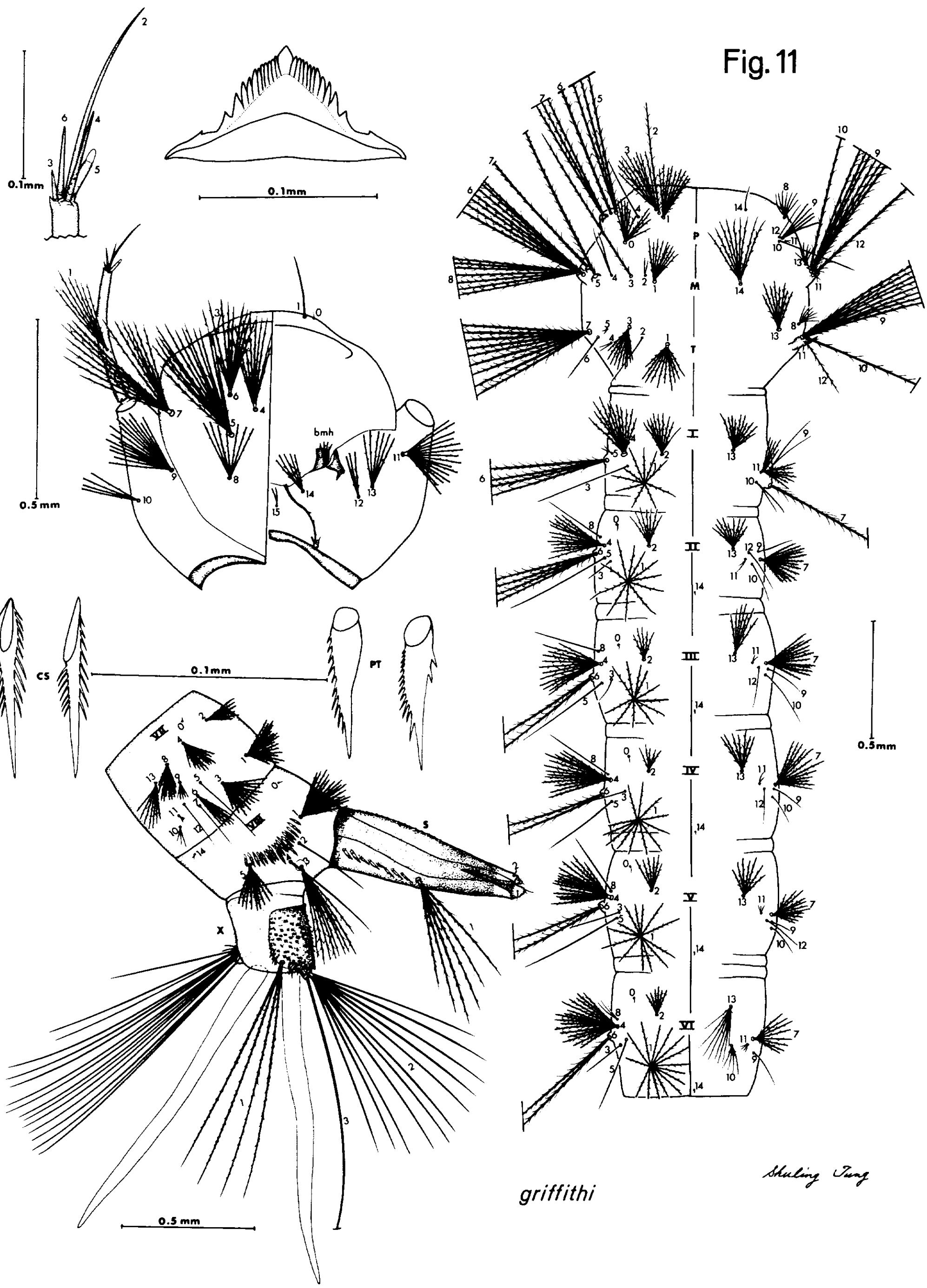


Fig. 11



griffithi

Shuling Tung

TABLE 1. Record of the Branching of the Setae on the Pupae of *Aedes (Ayurakitia) peytoni*

Hair	Range	Mode	Mean	Hair	Range	Mode	Mean
	Cephalothorax				Abdomen II		
1	2-4	3	3.1	0	1	1	1
2	2-3	2	2.1	1	6-14	9	8.9
3	3-5	4	4	2	1	1	1
4	2-5	3	3.4	3	1	1	1
5	3-5	4	4.1	4	4-9	4	5.3
6	1	1	1	5	3-7	4	5
7	2	2	2	6	1	1	1
8	2-4	3	3.1	7	2-5	2	2.9
9	1-2	1	1.1	9	1	1	1
	Metanotum			11	1-2	1	1.1
10	3-8	5	5.1		Abdomen III		
11	1	1	1	0	1	1	1
12	2-5	3	3.1	1	4-7	4	4.7
	Abdomen I			2	1	1	1
1	17-34	24	25.6	3	1	1	1
2	1	1	1	4	2-6	4	3.8
3	1	1	1	5	2-5	4	3.7
4	4-8	5	5.6	6	2-3	2	2.3
5	1-4	2	2.3	7	3-5	4	3.9
6	1	1	1	8	3-7	5	4.6
7	1-2	1	1.1	9	1	1	1
9	1	1	1	10	2	2	2
11	1-2	2	1.9	11	1	1	1
				14	1	1	1

TABLE 1. (Continued)

Hair	Range	Mode	Mean	Hair	Range	Mode	Mean
	Abdomen IV				Abdomen V (Cont.)		
0	1	1	1	11	1	1	1
1	2-5	5	3.8	14	1	1	1
2	1	1	1		Abdomen VI		
3	2-5	4	4.1	0	1	1	1
4	1	1	1	1	1-6	3	3.1
5	1	1	1	2	1	1	1
6	1-3	2	2.7	3	1-3	1	1.9
7	2-6	3	3.1	4	1-3	2	2
8	3-8	5	5.1	5	1	1	1
9	1	1	1	6	1-4	3	2.4
10	1-2	2	1.9	7	1-2	1	1.1
11	1	1	1	8	3-8	4	4.9
14	1	1	1	9	1	1	1
	Abdomen V			10	1-4	2	2.7
0	1	1	1	11	1	1	1
1	2-6	5	4	14	1	1	1
2	1	1	1		Abdomen VII		
3	1-3	1	1.9	0	1	1	1
4	2-3	2	2.2	1	1-5	2	2.5
5	1-2	1	1.1	2	1	1	1
6	1-3	2	1.8	3	1-6	4	3.3
7	3-7	5	4.9	4	2-3	2	2.2
8	2-7	4	4.1	5	1-4	2	2.3
9	1	1	1	6	4-11	6	6.1
10	1-2	2	1.7	7	1-2	1	1.2

TABLE 1. (Continued)

Hair	Range	Mode	Mean	Hair	Range	Mode	Mean
	Abdomen VII (Cont.)				Abdomen VIII		
8	4-10	5	5.8	0	1	1	1
9	2-4	3	2.9	4	1-2	1	1.4
10	1-4	3	2.6	9	4-8	6	5.9
11	1-4	2	2	14	1-2	2	1.6
14	1-2	1	1.3		Paddle		
				1	1	1	1

TABLE 2. Record of the Branching of the Setae on the Pupae of *Aedes (Ayurakitia) griffithi*

Hair	Range	Mode	Mean	Hair	Range	Mode	Mean
	Cephalothorax				Abdomen II		
1	2-3	3	2.6	0	1	1	1
2	1-2	2	1.8	1	5-11	8	7.9
3	4-6	5	5.1	2	1-2	1	1.1
4	2-4	3	2.9	3	1	1	1
5	2-4	3	3.3	4	4-7	5	5.1
6	1-2	1	1.1	5	2-7	5	4.4
7	2	2	2	6	1	1	1
8	2-7	4	4	7	1-4	3	2.6
9	1-3	2	1.7	9	1	1	1
	Metanotum			11	1-2	1	1.1
10	2-10	3	4.6		Abdomen III		
11	1	1	1	0	1	1	1
12	2-4	3	3	1	2-5	3	3.5
	Abdomen I			2	1	1	1
1	19-26	24	22.8	3	1	1	1
2	1-2	1	1.1	4	2-4	3	3.2
3	1	1	1	5	3-7	5	4.4
4	4-7	4	5.1	6	1-4	2	2
5	1-4	2	2.3	7	3-8	4	3.9
6	1	1	1	8	2-5	3	3.2
7	1-3	1	1.5	9	1	1	1
9	1	1	1	10	2	2	2
11	1	1	1	11	1	1	1
				14	1	1	1

TABLE 2. (Continued)

Hair	Range	Mode	Mean	Hair	Range	Mode	Mean
	Abdomen IV				Abdomen V (Cont.)		
0	1	1	1	11	1	1	1
1	2-4	3	3	14	1	1	1
2	1	1	1		Abdomen VI		
3	2-5	5	3.8	0	1	1	1
4	1	1	1	1	2-4	3	2.7
5	2	2	2	2	1	1	1
6	1-3	1	1.6	3	2-3	2	2.1
7	2-5	3	3.6	4	2-4	2	2.6
8	3-7	3	4	5	2	2	2
9	1	1	1	6	1-4	2	2.3
10	2-3	2	2.1	7	1-2	1	1.1
11	1	1	1	8	3-6	5	4.7
14	1	1	1	9	1	1	1
	Abdomen V			10	1-3	2	1.9
0	1	1	1	11	1	1	1
1	1-4	3	3	14	1	1	1
2	1	1	1		Abdomen VII		
3	2-3	2	2.3	0	1	1	1
4	1-3	2	2.3	1	1-4	2	2.3
5	2	2	2	2	1	1	1
6	1-3	2	1.8	3	2-6	5	4.1
7	4-8	6	5.6	4	2-4	2	2.6
8	4-7	5	5.3	5	2-3	3	2.6
9	1	1	1	6	6-9	7	6.8
10	1-3	2	1.8	7	1-3	2	1.9

TABLE 2. (Continued)

Hair	Range	Mode	Mean	Hair	Range	Mode	Mean
	Abdomen VII (Cont.)				Abdomen VIII		
8	3-9	5	5.8	0	1	1	1
9	4-7	5	5.6	4	2-4	2	2.6
10	1-3	2	2	9	13-20	18	17.1
11	1-4	1	1.8	14	1-4	1	1.7
14	1-4	2	2.2		Paddle		
				1	1	1	1

TABLE 3. Record of the Branching of the Setae on the Larvae of *Aedes (Ayurakitia) peytoni*

Hair	Range	Mode	Mean	Hair	Range	Mode	Mean
	Antenna (A)				Prothorax (P) (Cont.)		
1	5-8	6	5.9	7	3-5	3	3.9
	Head (C)			8	11-15	11	12.3
0	1	1	1	9	9-17	10	11.4
1	1	1	1	10	1-2	1	1.1
3	1	1	1	11	2-5	4	3.3
4	5-7	7	6.3	12	1	1	1
5	5-9	8	7.5	14	1	1	1
6	6-9	7	7.3		Mesothorax (M)		
7	9-14	11	11.5	1	20-26	21	21.8
8	1-3	2	2.1	2	2-3	3	2.9
9	5-13	7	7.9	3	1	1	1
10	2-4	2	2.3	4	1	1	1
11	15-21	19	18.4	5	1	1	1
12	2-4	2	2.2	6	6-8	7	6.8
13	4-7	6	5.7	7	1	1	1
14	7-14	7	8.2	8	7-12	9	8.9
15	2	2	2	9	8-10	9	9.1
bmh	5-7	5	5.6	10	1	1	1
	Prothorax (P)			11	1-2	1	1.1
0	18-25	20	21.6	12	1	1	1
1	16-21	17	17.9	13	11-14	11	11.9
2	1	1	1	14	19-27	23	22.3
3	7-16	12	11.5		Metathorax (T)		
4	1	1	1	1	20-31	23	24.4
5	2	2	2	2	1	1	1
6	1	1	1	3	19-28	23	22.6

TABLE 3. (Continued)

Hair	Range	Mode	Mean	Hair	Range	Mode	Mean
	Metathorax (T) (Cont.)				Abdomen II (Cont.)		
4	2-3	2	2.1	3	1	1	1
5	2-4	3	2.9	4	17-24	19	19.6
6	1	1	1	5	1	1	1
7	8-15	10	9.8	6	4-5	4	4.4
8	6-11	8	7.8	7	14-16	16	15.4
9	6-8	7	6.7	8	1	1	1
10	1	1	1	9	1	1	1
11	1-2	1	1.2	10	1	1	1
12	1	1	1	11	2-3	3	2.9
13	20-29	23	23.9	12	1	1	1
	Abdomen I			13	17-24	19	19.9
1	23-34	25	25.6	14	1	1	1
2	13-17	15	15.4		Abdomen III		
3	1	1	1	0	1	1	1
4	16-18	17	17	1	20-25	25	23.6
5	1-2	2	1.6	2	10-17	11	12.5
6	6-7	6	6.4	3	1	1	1
7	1-2	1	1.3	4	16-20	19	18
9	1	1	1	5	1	1	1
10	1	1	1	6	1-2	2	1.6
11	12-15	14	13.7	7	17-20	19	19
13	17-24	19	19.9	8	1	1	1
	Abdomen II			9	1	1	1
0	1	1	1	10	1	1	1
1	19-27	24	23.4	11	3-4	3	3.3
2	13-19	16	15.1	12	1	1	1

TABLE 3. (Continued)

Hair	Range	Mode	Mean	Hair	Range	Mode	Mean
	Abdomen III (Cont.)				Abdomen V (Cont.)		
13	15-19	17	16.8	6	2	2	2
14	1	1	1	7	16-23	16	18.3
	Abdomen IV			8	1	1	1
0	1	1	1	9	1	1	1
1	24-28	28	26.1	10	1	1	1
2	11-16	13	13	11	2-4	3	2.9
3	1	1	1	12	1	1	1
4	18-22	18	18.9	13	14-19	15	16
5	1	1	1	14	1	1	1
6	2	2	2		Abdomen VI		
7	20-24	21	21.7	0	1	1	1
8	1	1	1	1	19-30	28	28.8
9	1	1	1	2	13-23	15	16.3
10	1	1	1	3	1	1	1
11	2-4	2	2.6	4	20-27	23	22.8
12	1	1	1	5	1	1	1
13	14-20	17	16.6	6	2	2	2
14	1	1	1	7	15-19	19	17.4
	Abdomen V			8	2-3	3	2.6
0	1	1	1	9	1	1	1
1	22-30	28	26.6	10	9-12	12	10.3
2	12-16	13	14	11	2-3	3	2.8
3	1-2	1	1.1	12	1	1	1
4	18-22	18	19.1	13	14-17	16	15.7
5	1	1	1	14	1	1	1

TABLE 3. (Continued)

Hair	Range	Mode	Mean	Hair	Range	Mode	Mean
	Abdomen VII				Abdomen VIII		
0	1	1	1	0	1	1	1
1	21-27	25	24.4	1	17-24	17	19
2	14-18	16	15.9	2	1	1	1
3	20-23	20	20.9	3	6-8	7	6.8
4	14-19	15	15.6	4	1	1	1
5	1	1	1	5	5-11	6	6.9
6	10-15	13	12.1	14	2-3	2	1.9
7	1	1	1		Abdomen X		
8	18-25	18	19.7	1	1-3	2	1.8
9	3-5	4	4	2	6-9	7	7.1
10	7-14	9	9.3	3	1	1	1
11	3-5	3	3.8		Siphon		
12	1	1	1	1	4-7	5	5.4
13	10-13	13	11.6	2	1	1	1
14	1	1	1				

TABLE 4. Record of the Branching of the Setae on the Larvae of *Aedes (Ayurakitia) griffithi*

Hair	Range	Mode	Mean	Hair	Range	Mode	Mean
	Antenna (A)				Prothorax (P) (Cont.)		
1	5-8	6	6.4	7	3-4	3	3.4
	Head (C)			8	7-11	8	8.8
0	1	1	1	9	2-5	4	4.3
1	1	1	1	10	1	1	1
3	1	1	1	11	2-6	4	4
4	9-15	11	12.3	12	1	1	1
5	11-16	12	12.6	14	1	1	1
6	9-12	10	10.6		Mesothorax (M)		
7	12-17	16	14.5	1	8-13	13	11.2
8	5-9	7	6.8	2	2-4	3	2.9
9	11-17	15	14.7	3	1	1	1
10	2-4	3	3.3	4	1-2	2	1.9
11	15-22	16	18.1	5	1	1	1
12	2-3	3	2.6	6	7-10	8	8.1
13	4-6	5	4.7	7	1	1	1
14	4-7	6	5.1	8	7-9	9	8.4
15	2-3	3	2.6	9	6-10	10	8.8
bmh	3-4	3	3.4	10	1	1	1
	Prothorax (P)			11	1-3	2	2.2
0	11-17	15	14.3	12	1	1	1
1	7-13	11	12.8	13	6-16	8	8.8
2	1	1	1	14	7-10	9	9.8
3	8-10	9	8.9		Metathorax (T)		
4	1-2	1	1.4	1	8-11	9	8.8
5	3-4	3	3.1	2	1	1	1
6	1	1	1	3	11-17	11	14

TABLE 4. (Continued)

Hair	Range	Mode	Mean	Hair	Range	Mode	Mean
	Metathorax (T) (Cont.)				Abdomen II (Cont.)		
4	2-4	3	2.7	3	1-2	1	1.3
5	2-5	3	3.4	4	12-14	13	12.8
6	1	1	1	5	1	1	1
7	9-12	9	10.1	6	4-5	5	4.7
8	7-10	9	7.8	7	13-18	15	14.7
9	7-9	8	7.8	8	1	1	1
10	1	1	1	9	1	1	1
11	1-3	1	1.5	10	1	1	1
12	1	1	1	11	2-4	3	3.3
13	16-22	18	18.9	12	1	1	1
	Abdomen I			13	9-12	9	9.6
1	10-14	10	11.1	14	1	1	1
2	8-10	8	8.9		Abdomen III		
3	1	1	1	0	1	1	1
4	11-15	14	13.5	1	10-12	11	10.9
5	2	2	2	2	4-8	6	6
6	4-5	5	4.8	3	1	1	1
7	1	1	1	4	12-15	13	13.1
9	1-2	1	1.3	5	1	1	1
10	2	2	2	6	2	2	2
11	10-14	11	11.4	7	12-16	14	14.1
13	9-14	11	11.8	8	1	1	1
	Abdomen II			9	1	1	1
0	1	1	1	10	1	1	1
1	9-12	9	9.9	11	2-3	3	2.7
2	5-8	6	6.7	12	1	1	1

TABLE 4. (Continued)

Hair	Range	Mode	Mean	Hair	Range	Mode	Mean
	Abdomen III (Cont.)				Abdomen V (Cont.)		
13	7-11	8	8.6	6	2	2	2
14	1	1	1	7	11-15	12	12.6
	Abdomen IV			8	1	1	1
0	1	1	1	9	1	1	1
1	12-14	13	12.9	10	1	1	1
2	5-8	6	6.4	11	3-4	3	3.4
3	1	1	1	12	1	1	1
4	13-17	15	14.8	13	7-9	7	7.6
5	1	1	1	14	1	1	1
6	2	2	2		Abdomen VI		
7	12-17	13	13.6	0	1	1	1
8	1	1	1	1	15-18	16	16.5
9	1	1	1	2	6-8	7	7.1
10	1	1	1	3	1	1	1
11	2-6	3	3.5	4	16-18	16	16.5
12	1	1	1	5	1	1	1
13	6-10	7	7.8	6	2	2	2
14	1	1	1	7	8-13	11	11
	Abdomen V			8	2-3	2	2.4
0	1	1	1	9	1	1	1
1	13-19	14	14.6	10	3-4	4	3.6
2	6-9	6	7.1	11	3-4	4	3.6
3	1-2	1	1.3	12	1	1	1
4	15-18	15	15.9	13	8-11	9	8.7
5	1	1	1	14	1	1	1

TABLE 4. (Continued)

Hair	Range	Mode	Mean	Hair	Range	Mode	Mean
	Abdomen VII				Abdomen VIII		
0	1	1	1	0	1	1	1
1	16-19	18	17.8	1	14-20	15	16.6
2	5-8	8	6.6	2	1	1	1
3	13-19	15	16	3	8-11	9	9
4	10-15	13	12.6	4	1	1	1
5	1	1	1	5	7-10	8	8.2
6	5-8	6	5.9	14	2-3	2	2.2
7	1	1	1		Abdomen X		
8	10-16	13	13.5	1	4-5	4	4.1
9	5-6	6	5.7	2	10-13	10	10.6
10	3-6	4	4.1	3	1	1	1
11	3-5	3	3.5		Siphon		
12	1	1	1	1	6-7	6	6.4
13	7-10	8	8.4	2	1	1	1
14	1	1	1				

INDEX

Italicized pages are those which begin the primary treatment of the taxon. Numbers in parenthesis refer to the figures illustrating the species in question.